

US EPA RECORDS CENTER REGION 5



445247

SCREENING SITE INSPECTION REPORT  
FOR  
CARSTAB CORP  
READING, OHIO  
U.S. EPA ID: OHDO00724138  
SS ID: NONE  
TDD: F05-9008-013  
PAN: FOH0022SA

AUGUST 19, 1991




**ecology and environment, inc.**

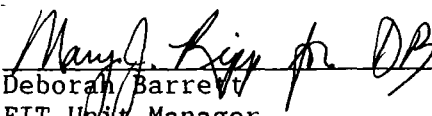
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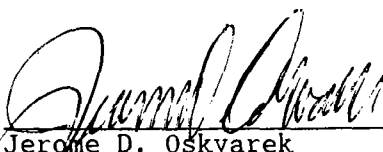
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Prepared by:  Date: 9-19-91  
Mark Dunnigan  
FIT Report Preparer  
Ecology and Environment, Inc.

Reviewed by:  Date: 9-19-91  
Deborah Barrett  
FIT Unit Manager  
Ecology and Environment, Inc.

Approved by:  Date: 9/19/91  
Jerome D. Oskvarek  
FIT Office Manager  
Ecology and Environment, Inc.

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## 1. INTRODUCTION

Ecology and Environment, Inc., Field Investigation Team (FIT) was tasked by the United States Environmental Protection Agency (U.S. EPA) to conduct a screening site inspection (SSI) of the Carstab Corp (Carstab) site (aka Morton International) under contract number 68-01-7347.

The site was discovered by U.S. EPA on June 1, 1981, when Carstab Corporation submitted a Notification of Hazardous Waste Site form to U.S. EPA, pursuant to section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (U.S. EPA 1981).

The site was evaluated in the form of a preliminary assessment (PA) that was submitted to U.S. EPA. The PA was prepared by Scott Shane of the Ohio Environmental Protection Agency (OEPA) and is dated May 23, 1986 (U.S. EPA 1986).

FIT prepared an SSI work plan for the Carstab site under technical directive document (TDD) F05-8706-234, issued on June 15, 1987. The SSI work plan was approved by U.S. EPA on August 21, 1990. The SSI of the Carstab site was conducted on October 1 and 2, 1990, under TDD F05-9008-013, issued on August 23, 1990.

The FIT SSI included an interview with site representatives, a reconnaissance inspection of the site, and the collection of six soil samples, one sediment sample, and five monitoring well samples.

The purposes of an SSI have been stated by U.S. EPA in a directive outlining Pre-Remedial Program strategies. The directive states:

All sites will receive a screening SI to 1) collect additional data beyond the PA to enable a more refined preliminary HRS [Hazard Ranking System] score, 2) establish priorities among sites most likely to qualify for the NPL [National Priorities List], and 3) identify the most critical data requirements for the listing SI step. A screening SI will not have rigorous data quality objectives (DQOs). Based on the refined preliminary HRS score and other technical judgement factors, the site will then either be designated as NFRAP [no further remedial action planned], or carried forward as an NPL listing candidate. A listing SI will not automatically be done on these sites, however. First, they will go through a management evaluation to determine whether they can be addressed by another authority such as RCRA [Resource Conservation and Recovery Act].... Sites that are designated NFRAP or deferred to other statutes are not candidates for a listing SI.

The listing SI will address all the data requirements of the revised HRS using field screening and NPL level DQOs. It may also provide needed data in a format to support remedial investigation work plan development. Only sites that appear to score high enough for listing and that have not been deferred to another authority will receive a listing SI. (U.S. EPA 1988)

U.S. EPA Region V has also instructed FIT to identify sites during the SSI that may require removal action to remediate an immediate human health or environmental threat.

## 2. SITE BACKGROUND

### 2.1 INTRODUCTION

This section presents information obtained from SSI work plan preparation, the site representative interview, and the reconnaissance inspection of the site.

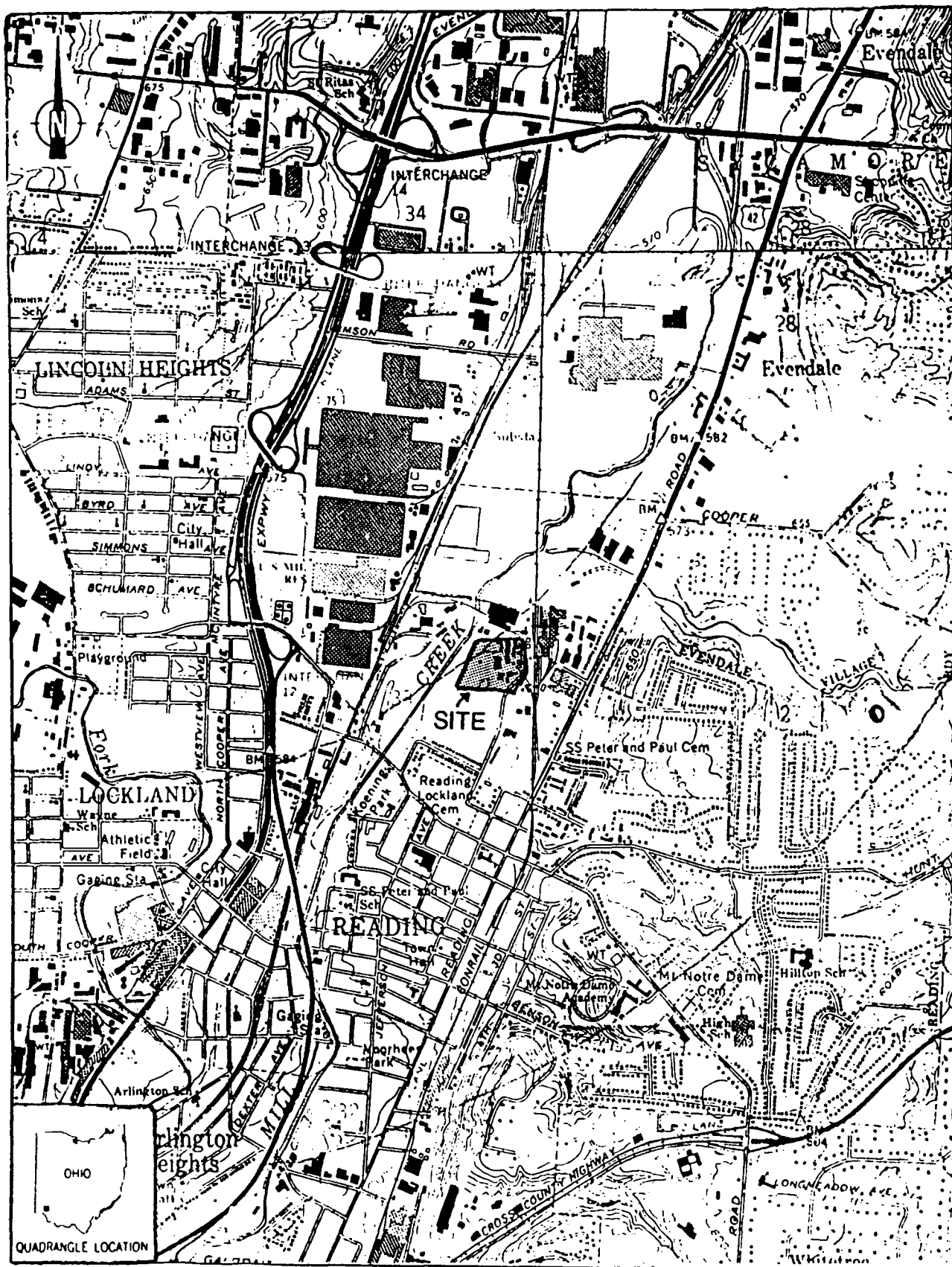
### 2.2 SITE DESCRIPTION

The Carstab site is an active chemical manufacturing plant that is located on an approximately 26-acre parcel of land in the northern section of Reading, Hamilton County, Ohio (S1/2NE1/4 sec. 33, T.4., R.1.) (see Figure 2-1 for site location). Reading is a northern suburb of Cincinnati, Ohio. The site is located amidst industrial and residential properties.

The Comprehensive Environmental Response, Compensation, and Liability Information System lists the address of the site as 1560 West Street. The actual address is 2000 West Street, which is at the north end of the street.

The north border of the Carstab site adjoins two properties, one of which is an NPL site and the other of which has been subject to regulatory and enforcement actions (U.S. EPA 1981; Ecology and Environment, Inc. [E & E] 1982). The west side of the Carstab site is adjacent to Mill Creek.

A 4-mile radius map of the Carstab site is provided in Appendix A.



SOURCE: USGS, Glendale, OH Quadrangle, 7.5 Minute Series, 1965, photorevised 1982, Cincinnati East, OH Quadrangle, 7.5 Minute Series, 1961, photorevised 1981.

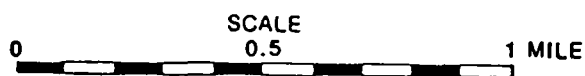


FIGURE 2-1 SITE LOCATION

## 2.3 SITE HISTORY

The Carstab site is currently occupied by Carstab Corporation, a chemical manufacturer of products for the plastics and petroleum industries. Carstab Corporation has operated on-site since 1980 (E & E 1982; U.S. EPA 1986; Beiser, Hanley, and Schaaf 1990).

In 1948 Cincin Milling Machine Company (Cincin) purchased the undeveloped site and constructed a chemical plant that began operations in December 1949 (Beiser, Hanley, and Schaaf 1990). Cincin owned and operated the plant until May 15, 1980, when Thiokol Corporation purchased the site (Beiser, Hanley, and Schaaf 1990). Thiokol Corporation merged with Morton International in 1982, and then separated in 1989. Since July 1, 1989, the Carstab site has been owned and operated by Morton International (Beiser, Hanley, and Schaaf 1990).

Carstab Corporation, a subsidiary of Thiokol Corporation, manufactures synthetic stabilizers, waxes, asphalt additives, and plasticizers for the plastics and petroleum industries (E & E 1982; U.S. EPA 1986; Beiser, Hanley, and Schaaf 1990) (see Appendix B for raw materials, intermediate products, and finished products at the Carstab site).

Carstab Corporation generates approximately 150,000 to 170,000 pounds of hazardous wastes per year. The wastes are byproducts resulting from the manufacture of up to 80 different products. Waste materials from approximately half of the product lines are discharged from the site, while the remaining waste materials are temporarily stored on-site before being disposed of off-site (Beiser, Hanley, and Schaaf 1990) (see Appendix C for hazardous wastes generated at the Carstab site and Appendix D for discharge permits at the Carstab site). Glenn Schaaf, Manager of Health, Safety, and Environmental for Morton International, indicated that no chemical spills have occurred on-site since 1982 and that injuries or exposures caused by direct contact with materials have not occurred (Schaaf 1991).

Between 1950 and 1955, six pits were excavated on-site for the disposal of selected liquid wastes (E & E 1982; Beiser, Hanley, and Schaaf 1990). The pits consisted of one clear water basin, three acid neutralization ponds, and two settling ponds (E & E 1982). Sulfuric and hydrochloric acids were neutralized, and organic compounds and oils were disposed of, in the pits (U.S. EPA 1986; Beiser, Hanley, and Schaaf

1990). Each pit was approximately 2,500 square feet in area and approximately 5 to 6 feet deep (Beiser, Hanley, and Schaaf 1990). By 1980 all of the pits had been dredged, filled with dolomite stone, and covered with topsoil (E & E 1982; U.S. EPA 1986; Beiser, Hanley, and Schaaf 1990). It is not known whether the pits had engineered liners. The quantity of material dredged out and the location of its disposal are not known.

An explosion and fire in 1969 resulted in the destruction of a process building (Beiser, Hanley, and Schaaf 1990). According to Reading Fire Chief Robert Hollmeyer, the explosion and fire occurred during normal on-site processing practices and that sodium used in the manufacturing process was involved. One employee was killed in the explosion and fire, while another employee was severely injured (Hollmeyer 1991).

Prior to 1978, an unknown number of plant employees were exposed to dimethyltin dichloride (U.S. EPA 1986; Gibbons 1991). The exposures took place over several years. The exposures caused symptoms of anxiety, impotence, loss of self drive, loss of memory, and anger. The building where the exposures took place was closed in 1978, and was replaced by another processing building (U.S. EPA 1986; Gibbons 1991). A lawsuit against Carstab Corporation has been filed by employees claiming compensation for injuries and mental anguish caused by the exposure (Gibbons 1991).

On June 29, 1979, OEPA personnel discovered leachate on the east bank of Mill Creek (E & E 1982). In 1980 and 1981, FIT conducted inspections of the Carstab site. It is alleged that wastes contained in steel and fibre drums were deposited on-site, and that the drums are buried as deep as 15 feet in the southwest portion of the site (E & E 1982; Cincinnati Enquirer 1980). The area in which the drums are allegedly buried is near or under the northwest portion of the main parking lot (U.S. EPA 1981; E & E 1982). During inspections conducted on August 1 and 7, 1980, FIT used metal detectors to determine the location of the drums, but the results were inconclusive (E & E 1982).

On July 30, 1980, OEPA met with representatives of Carstab Corporation to request that Carstab Corporation hire a hydrogeologic



consulting firm to determine the extent of contamination and a method of controlling or removing it. PEDCo Environmental, Inc. (PEDCo), was hired to prepare a study proposal. PEDCo installed 10 monitoring wells on-site. In January 1981, H. C. Nutting Company, a subcontractor, installed 4 more monitoring wells (Gibbons 1991a). Investigations of the two sites immediately north of the Carstab site, and an investigation of the Carstab site, indicated that contaminants found in sediment samples collected from the east bank of Mill Creek, and in groundwater samples collected in the area, may be attributable to the Carstab site. Analysis of soil samples from two borings collected at the Carstab site by FIT in January 1981 detected numerous metals, including zinc, lead, and sodium, and organic compounds, including 1,2-dichlorobenzene, PCB-1260, and aliphatic hydrocarbons (E & E 1982). During the inspection, FIT also installed three monitoring wells on-site. Groundwater samples were collected from the wells on January 15, 1981, and on December 8 and 9, 1981. Analysis of the samples detected concentrations of metals, such as beryllium, zinc, and arsenic, and organics, especially hexachlorobutadiene and methylene chloride, at levels greater than in upgradient wells (E & E 1982).

In 1979, regulatory and enforcement actions were taken by OEPA against the Carstab site to delineate sources of alleged contamination into Mill Creek (Gibbons 1991; E & E 1982). OEPA eventually filed a Director's Findings and Orders against Carstab Corporation on December 1, 1982. The findings and orders requested that Carstab Corporation perform investigatory and remedial work. Carstab Corporation appealed the orders, and the orders were revoked. A second set of findings and orders were issued by OEPA on January 15, 1983. Since then, Carstab Corporation has cooperated with OEPA (Gibbons 1991). Carstab Corporation did have some investigatory and remedial work performed, resulting in the installation of a slurry wall and a french drain (U.S. EPA 1986; Gibbons 1991). The slurry wall and the french drain were expected to be fully operational by May 1985 (Gibbons 1991a). The dates of when the investigatory work and remedial work were performed, as well as who performed the work, are not known.

Carstab Corporation applied for a Part A RCRA permit on November 17, 1980. This permit was closed on an unknown date, and "interim"

status has been assigned to the site (Heller 1991). Numerous OEPA RCRA inspections and reports have been performed at the Carstab site. The last RCRA inspection was on November 9, 1987, when a "Return of Compliance Inspection" was performed (O'Connell 1991).

### 3. SCREENING SITE INSPECTION PROCEDURES AND FIELD OBSERVATIONS

#### 3.1 INTRODUCTION

This section outlines procedures and observations of the SSI of the Carstab site. Individual subsections address the site representative interview, reconnaissance inspection, and sampling procedures. Rationales for specific FIT activities are also provided. The SSI was conducted in accordance with the U.S. EPA-approved work plan with the following exceptions.

The work plan called for the collection of four soil samples and three sediment samples. However, six soil samples and one sediment sample were collected. The two additional soil samples were collected from on-site areas where runoff to a body of surface water might occur. FIT collected one sediment sample rather than three because industrial properties, including an NPL site, are located upstream from the Carstab site. Therefore, the results of sediment sampling could not be attributed to the Carstab site.

The U.S. EPA Potential Hazardous Waste Site Inspection Report (Form 2070-13) for the Carstab site is provided in Appendix E.

#### 3.2 SITE REPRESENTATIVE INTERVIEW

At 8:30 a.m. on October 1, 1990, Cortney Schmidt, FIT team leader, conducted an interview with Bruce E. Beiser, John Hanley, and Glenn Schaaf, Plant Manager, Senior Administrator, and Manager of Health, Safety, and Environmental, respectively, for Morton International. Also present at the interview were Nathan Russell of FIT. During the reconnaissance inspection FIT was accompanied by Amy F. Gibbons,

Tom Schneider, and Gemini Sasson of OEPA. Several representatives of Carstab Corporation joined FIT, then departed, during the reconnaissance inspection. The interview was conducted in one of the office buildings on-site. The interview was conducted to gather information that would aid FIT in conducting SSI activities.

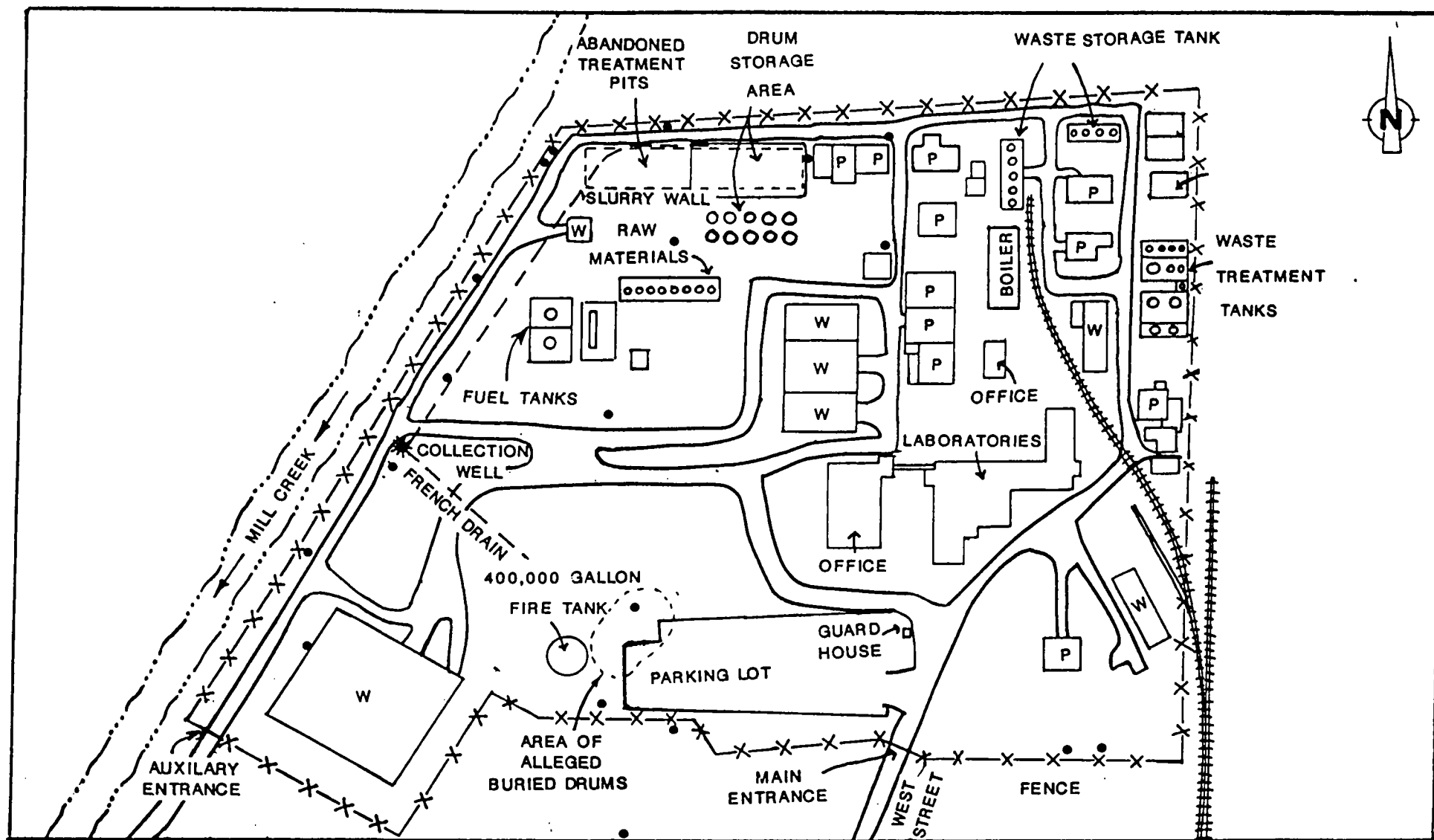
### 3.3 RECONNAISSANCE INSPECTION

Following the site representative interview, FIT conducted a reconnaissance inspection of the Carstab site and surrounding area in accordance with E & E health and safety guidelines. The reconnaissance inspection began at 11:20 a.m. on October 1, 1990, and included a walk-through of the site to determine appropriate health and safety requirements for conducting on-site activities and to make observations to aid in characterizing the site. FIT also determined sampling locations during the reconnaissance inspection. FIT was accompanied by site representatives as well as OEPA during the reconnaissance inspection.

Reconnaissance Inspection Observations. The Carstab site is approximately 26 acres in size, and is roughly square in shape. The site is located at 2000 West Street, approximately 1/3 mile east of the Mill Creek Expressway (I75). A fence surrounds the entire site, and gates are guarded 24 hours per day. South of the site are a baseball field and residential areas. Industrial properties are located north, east, and west of the site. A set of railroad tracks runs parallel to the southern half of the east side of the site. A railroad spur enters the east side of the site and runs northwest, terminating near waste storage tanks in the northeast corner of the site. Mill Creek flows northeast to southwest, adjacent to the west side of the site.

The main entrance to the site is from the south, off of West Street (see Figure 3-1 for site features). Immediately inside the main entrance is a large, paved parking lot with a guardhouse in the northeast corner of the lot. There are paved roads leading around the periphery of the site and between the various buildings of the manufacturing plant. The area in which drums are allegedly buried is located near, or beneath, the northwest corner of the parking lot.

FIT observed 20 buildings in the northeast portion of the site, including two office buildings and a laboratory building. The 17 other



SCALE  
0 125 250 375 500 FEET

LEGEND  
P PRODUCTION BUILDING  
W WAREHOUSE  
• MONITORING WELL

FIGURE 3-1 SITE FEATURES

buildings consist mostly of warehouses and processing buildings. A boiler, waste storage tanks, and waste treatment tanks are also located in the northeast portion of the site.

In the southwest corner of the site is a large warehouse that received a relatively large amount of truck traffic during the SSI. Between the parking lot and the warehouse is a 400,000-gallon fire tank assumed to be filled with water. An auxiliary entrance is located in the southwest corner of the site, adjacent to the warehouse, but FIT did not observe any traffic entering or exiting this entrance.

There are 70 storage tanks, with capacities ranging from 1,000 to 48,000 gallons, located in the northern portion of the site. The tanks contain propane, asphalt additives, feedstocks, paving bond additives, stannic chloride, methyl chloride solution, and finished products (Beiser, Hanley, and Schaaf 1990). All but a few tanks have dike containment systems.

Approximately 150, 55-gallon drums of liquid hazardous waste are temporarily stored in the northwest corner of the site. Solid wastes are stored in plastic-lined cardboard boxes with "Cecos" on the label. There were approximately 25 boxes, approximately 1 cubic yard in size, adjacent to the drum storage area at the time of the SSI. Immediately south of this location is an area in which raw materials are stored.

A slurry wall, which is designed to contain spills, is located in the northwest corner of the site, beginning in the area where six abandoned treatment pits are located. The french drain system begins in the northwest corner of the site, runs southwest along the periphery of the site, then runs southeast and terminates near a fire tank (U.S. EPA 1986; Gibbons 1991). Materials collected by these systems are discharged to the Cincinnati municipal sewer system (U.S. EPA 1986). FIT was informed by site representatives that 17 monitoring wells are located on-site (Beiser, Hanley, and Schaaf 1990).

FIT photographs from the SSI of the Carstab site are provided in Appendix F.

### 3.4 SAMPLING PROCEDURES

Samples were collected by FIT at locations selected during the reconnaissance inspection to determine whether U.S. EPA Target Compound

List (TCL) compounds or Target Analyte List (TAL) analytes were present at the site. The TCL and TAL are included with corresponding quantitation/detection limits in Appendix G.

On October 1, 1990, FIT collected six soil samples, including one potential background sample, and one sediment sample. On October 2, 1990, FIT collected five groundwater samples from on-site monitoring wells. Portions of each on-site sample were given to the site representatives.

Soil/Sediment Sampling Procedures. Soil samples S1, S2, S4, S5, and S6 were collected on-site. Soil sample S1 was collected near the southeast corner of an abandoned acid treatment pit located in the northwest corner of the site (see Figure 3-2 for soil/sediment sampling locations). The sample was a grab sample collected at a depth of approximately 9 feet, from a location where OVA readings peaked at 40 ppm above background. This sample was collected to determine whether TCL compounds or TAL analytes had migrated from the area of the treatment pit.

Soil sample S2 was collected near the southwest corner of the same abandoned acid treatment pit, in the northwest corner of the site. This grab sample was collected at a depth of approximately 7 feet, from a location where OVA readings peaked at over 300 ppm above background.

Surface soil sample S4 was collected near storage tanks in the northeast corner of the site, from a location where spills from nearby storage tanks could potentially reach the soil. Surface soil sample S5 was collected from a ditch in the southeast corner of the site. Surface soil sample S6 was collected from an area of stained grass in the northwest portion of the site, immediately south of where raw materials are stored.

Sediment sample S3 was collected off-site, adjacent to the northwest corner of the site. This surface sample was a grab sample collected from the east bank of Mill Creek, approximately 2 feet above water level, where a dry crystalline material was observed.

Surface soil sample S7, the potential background sample, was a grab sample collected from the baseball field south of the site, from a location approximately 200 feet south of the on-site parking lot (see Figure 3-3 for the additional soil sampling location). The potential

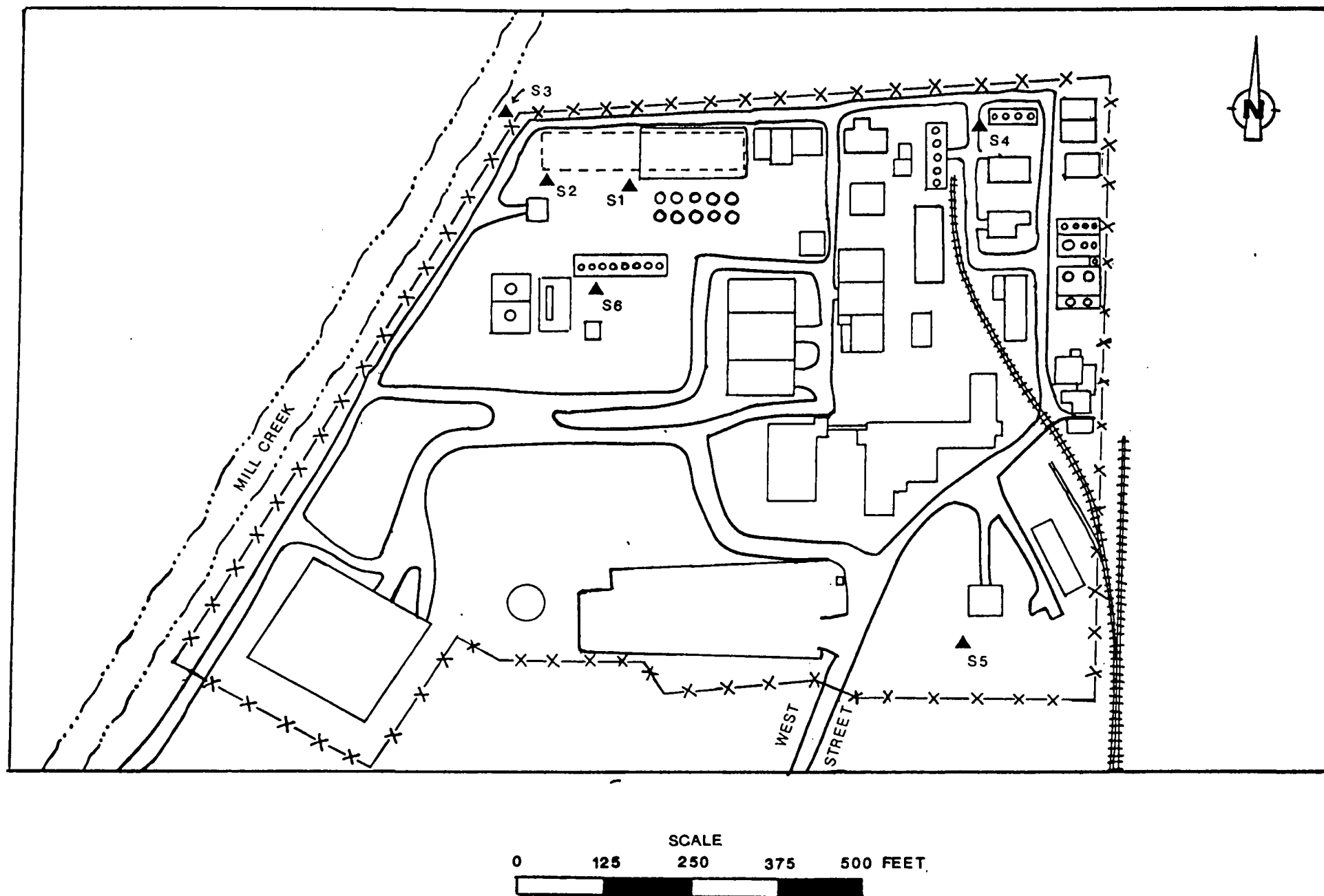


FIGURE 3-2 SOIL/SEDIMENT SAMPLING LOCATION





SOURCE: USGS, Glendale, OH Quadrangle, 7.5 Minute Series, 1965, photorevised 1982, Cincinnati East, OH Quadrangle, 7.5 Minute Series, 1961, photorevised 1981.



FIGURE 3-3 ADDITIONAL SOIL SAMPLING LOCATION

background soil sample was collected to determine the representative chemical constituents of the soil in the area surrounding the site.

Soil samples S1 and S2 were collected with a power auger. A bucket auger was then used to collect the sample material from the bottom of the hole.

Volatile organic sample portions were transferred directly to sample bottles, using trowels and spoons. The remaining sample portions were placed in a bowl and mixed with a trowel before being transferred to sample bottles.

Standard E & E decontamination procedures were adhered to during the collection of all soil/sediment samples. The procedures included the scrubbing of all equipment (e.g., bowls, trowels, spoons, and augers) with a solution of detergent (Alconox) and distilled water, and triple-rinsing the equipment with distilled water before the collection of each sample (E & E 1987). All soil samples were packaged and shipped in accordance with U.S. EPA-required procedures.

As directed by U.S. EPA, all soil/sediment samples were analyzed using the U.S. EPA Contract Laboratory Program (CLP).

Monitoring Well Sampling Procedures. On October 2, 1990, FIT collected five monitoring well samples in order to characterize groundwater at the site. Sample MW1 was collected from a monitoring well located approximately 75 feet north of the parking lot (see Figure 3-4 for monitoring well sampling locations and Table 3-1 for monitoring well data). Sample MW2 was collected from a monitoring well located approximately 25 feet west of the southwest corner of the parking lot. Monitoring wells MW1 and MW2 are located near the area in which drums of hazardous waste are allegedly buried. Sample MW3 was collected from a monitoring well located near the middle of the fence on the west side of the site. Sample MW4 was collected from a monitoring well located in the west-central portion of the site. Sample MW5 was collected from a monitoring well located at the northwest corner of the site. Monitoring well MW5 is the well located nearest to the abandoned treatment pits. No upgradient monitoring wells were sampled because potential upgradient wells were either damaged or dry.

In accordance with U.S. EPA quality assurance/quality control requirements, a duplicate monitoring well sample and a field blank

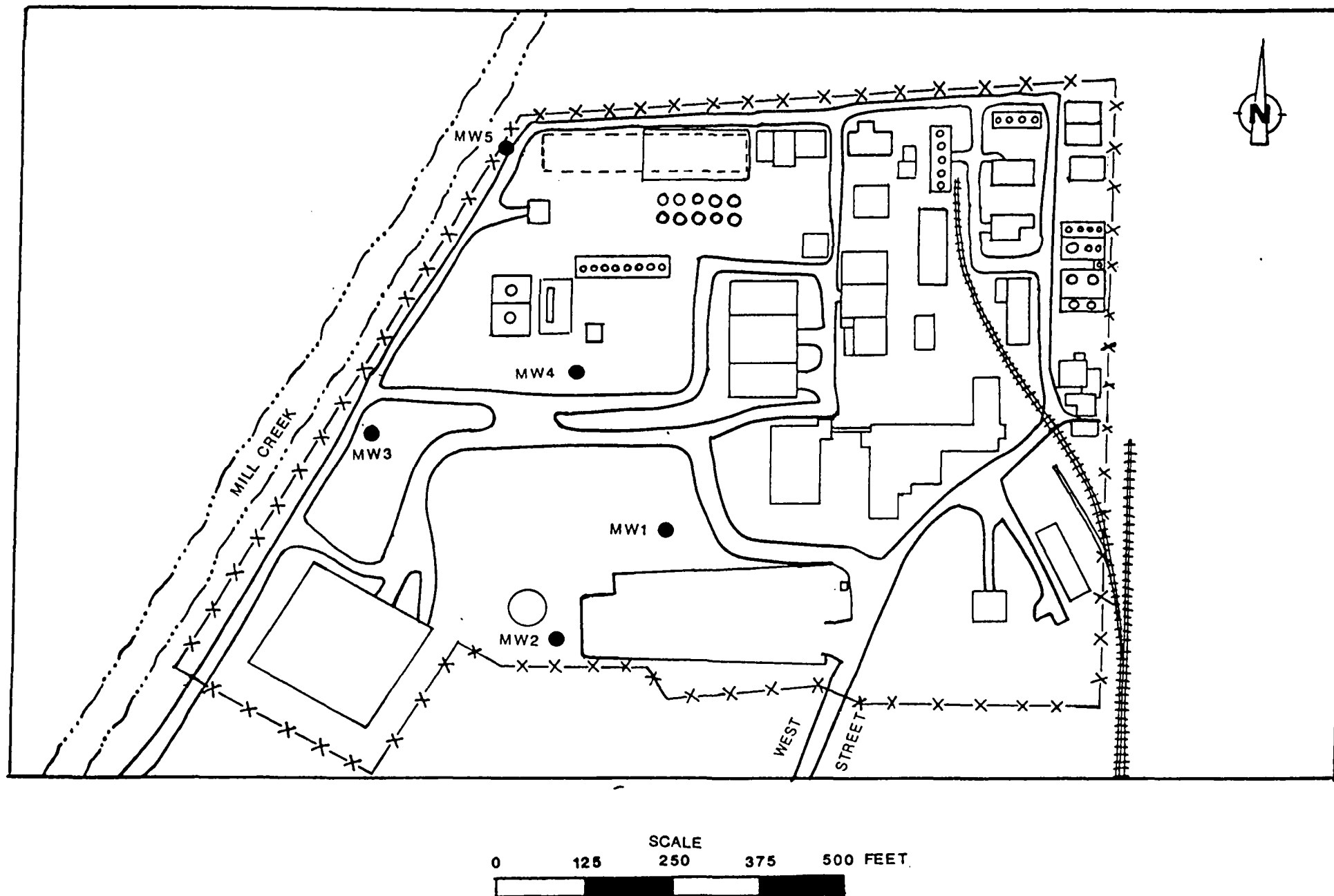


FIGURE 3-4 MONITORING WELL SAMPLING LOCATIONS

Table 3-1

## MONITORING WELL DATA

Well	Well Depth (feet)	Elevation (feet above mean sea level)	Depth to Water (feet)
MW1	19.0	560.93	16.0
MW2 (and Duplicate)	27.0	565.97	24.0
MW3	19.0	552.45	17.7
MW4	19.5	555.56	12.0
MW5	20.5	554.80	12.1

sample were collected. The duplicate sample was collected at location MW2. The field blank sample was prepared from distilled water.

All monitoring wells were purged of three to five volumes of standing water prior to the collection of each sample. All monitoring well samples were collected with stainless steel bailers that had been scrubbed with a solution of detergent (Alconox) and distilled water, and triple-rinsed with distilled water prior to the collection of each sample (E & E 1987).

As directed by U.S. EPA, all monitoring well samples were analyzed using the U.S. EPA CLP.

#### 4. ANALYTICAL RESULTS

This section presents results of the chemical analysis of FIT-collected soil/sediment and monitoring well samples for TCL compounds and TAL analytes. All samples were analyzed for volatile organics, semivolatile organics, pesticides/polychlorinated biphenyls (PCBs), metals, and cyanides. Complete chemical analysis results of FIT-collected soil/sediment and monitoring well samples are provided in Tables 4-1 and 4-2. In addition, significant tentatively identified compounds (TICs) detected in the analysis of FIT-collected samples are also provided in Tables 4-1 and 4-2.

Quantitation/detection limits used in the analysis of soil/sediment and monitoring well samples are provided in Appendix D.

The analytical data from the chemical analysis of FIT-collected samples for this SSI have been reviewed under the direction of U.S. EPA for validity; the review has been approved by U.S. EPA. The analytical data have also been reviewed by FIT for usability. Any additions, deletions, or changes resulting from a review of the data have been incorporated in the chemical analysis results tables presented in this section.

Monitoring well sample MW5 was not analyzed for TAL analytes because the well did not have sufficient recharge for the collection of a complete sample. The specific conductivity of the monitoring well samples was not obtained because the equipment malfunctioned.

Table 4-1  
RESULTS OF CHEMICAL ANALYSIS OF  
FIT-COLLECTED SOIL/SEDIMENT SAMPLES

Sample Collection Information and Parameters	<u>Sample Number</u>						
	S1	S2	S3	S4	S5	S6	S7
Date	10/1/90	10/1/90	10/1/90	10/1/90	10/1/90	10/1/90	10/1/90
Time	1400	1640	1700	1730	1750	1810	1830
CLP Organic Traffic Report Number	EHW74	EHW75	EHW76	EHW77	EHW78	EHW79	EHW80
CLP Inorganic Traffic Report Number	MEGS71	MEGS72	MEGS73	MEGS74	MEGS75	MEGS76	MEGS77
<u>Compound Detected</u> (values in $\mu\text{g/kg}$ )							
<u>Volatile Organics</u>							
carbon disulfide	--	--	37J	--	--	--	--
1,2-dichloroethane	--	--	2J	--	--	--	--
2-butanone (MEK)	--	--	180J	--	--	--	--
toluene	--	5,000J	--	--	--	--	--
chlorobenzene	--	12,000J	54J	--	--	--	--
ethylbenzene	--	1,600J	82J	--	--	--	--
xylenes (total)	--	10,000J	82J	--	--	--	--
<u>Semivolatile Organics</u>							
bis(2-chloroethyl)ether	4,400	--	--	--	--	--	--
1,3-dichlorobenzene	--	59,000	--	--	--	--	--
1,4-dichlorobenzene	--	280,000	--	--	--	--	--
1,2-dichlorobenzene	--	3,300,000D	670J	--	--	--	--
bis(2-chloroisopropyl)ether	--	--	280J	--	--	--	--
phenanthrene	--	--	540J	--	--	500	84J
anthracene	--	--	--	--	--	130J	--
fluoranthene	--	--	1,000	--	--	500	200J
pyrene	--	--	740J	--	--	--	--
benzo[a]anthracene	--	--	370J	--	--	220J	--
chrysene	--	--	530J	--	--	270J	--
bis(2-ethylhexyl)phthalate	--	--	500J	5,900	--	210J	--
benzo[b]fluoranthene	--	--	540J	--	--	470	170J

Table 4-1 (Cont.)

Sample Collection Information and Parameters	Sample Number						
	S1	S2	S3	S4	S5	S6	S7
benzo[k]fluoranthene	--	--	400J	--	--	--	--
benzo[a]pyrene	--	--	440J	--	--	210J	--
<u>Pesticides/PCBs</u>							
Aroclor 1254	--	--	--	550	--	--	--
<u>TICs†</u>							
methyl-cyclohexane (108-87-2)	--	--	1,400J	--	--	--	--
7-(diethylamine)-4-methyl-2H-1- benzopyran-2-one (91-44-1)	1,300J	680,000J	7,700J	--	--	--	--
1,1'-biphenyl (92-52-4)	--	13,000J	7,400J	--	--	--	--
tetrakis(2-methylpropelyne)-stannane (3531-43-9)	--	210,000J	--	--	--	--	--
(triphenylphosphoranylidene)-methyl ester acetic acid (2605-67-6)	--	50,000J	--	--	--	850J	--
triphenyl-phosphine sulfide (3878-45-3)	--	57,000J	--	--	--	--	--
cyclohexanethiol (1569-69-3)	--	--	3,600J	--	--	--	--
benzenemethanethiol (100-53-8)	--	--	13,000J	--	--	--	--
4-morpholineethanamine (2038-03-1)	--	--	4,100J	--	--	--	--



Table 4-1 (Cont.)

Sample Collection Information and Parameters	Sample Number						
	S1	S2	S3	S4	S5	S6	S7
1,1'-oxybis-benzene (101-84-8)	—	—	27,000J	—	—	—	—
<u>Analyte Detected</u> (values in mg/kg)							
aluminum	13,100	8,060	8,330	8,110	11,500	17,600	8,000
antimony	—	—	—	8.2BNJ	—	—	13.5NJ
arsenic	7.9NJ	6.3NJ	4.4NJ	8.5NJ	6.1NJ	8.7NJ	7.93+NJ
barium	318N*J	72.7N*J	44.7BN*J	56.3N*J	105N*J	165N*J	76.3N*J
beryllium	0.37B	—	0.36B	—	0.47B	0.79B	0.4B
calcium	17,400	49,800	61,500	59,700	5,600	8,100	1,760
chromium	15.1	57.6	19.2	12.4	20	21.7	11.8
cobalt	8.6B	21.9	7.8B	5.8B	9.9B	11.6B	7.5B
copper	10.4	50.6	24.3	34.1	26.1	20.3	11.5
iron	24,200	11,800	14,700	12,800	17,300	24,100	12,600
lead	8.9N	79.1N	22.1N	23.2N	98.8N	78.3N	33.1N
magnesium	6,140	10,900	13,700	28,200	3,310	3,770	1,360
manganese	3,300*J	341*J	334*J	454*J	988*J	1,290*J	714*J
mercury	—	—	—	0.13	0.34	—	—
nickel	20	14.2	23.1	14	18.1	22.1	10.8
potassium	1,520	729B	1,120B	922B	1,610	2,160	1,260
selenium	—	—	—	—	—	0.85BWJ	1.5
sodium	1.46B	62.4B	200B	95.5B	251B	72.8B	37.2B
thallium	0.63BWNJ	—	0.62BNJ	—	—	—	0.49BWNJ
vanadium	27.5	17	17.9	18.8	26.5	30.8	19.9
zinc	42.9	243	80.4	346	144	75.1	128

† TIC Chemical Abstracts Service (CAS) numbers, if available, are provided in parentheses.

— Not detected.

Table 4-1 (Cont.)

COMPOUND QUALIFIERS	DEFINITION	INTERPRETATION
J	Indicates an estimated value.	Compound value may be semiquantitative.
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.	Alerts data user to a possible change in the CRQL. Data is quantitative.
ANALYTE QUALIFIERS	DEFINITION	INTERPRETATION
N	Spike recoveries outside QC protocols, which indicates a possible matrix problem. Data may be biased high or low. See spike results and laboratory narrative.	Value may be quantitative or semiquantitative.
*	Duplicate value outside QC protocols which indicates a possible matrix problem.	Value may be quantitative or semiquantitative.
+	Correlation coefficient for standard additions is less than 0.995. See review and laboratory narrative.	Data value may be biased.
B	Value is real, but is above instrument DL and below CRDL.	Value may be quantitative or semiquantitative.
J	Value is above CRDL and is an estimated value because of a QC protocol.	Value may be semiquantitative.
W	Post-digestion spike for furnace AA analysis is out of control limits (35-115%), while sample absorbance is <50% of spike absorbance.	Value may be semiquantitative.

Table 4-2  
RESULTS OF CHEMICAL ANALYSIS OF  
FIT-COLLECTED MONITORING WELL SAMPLES

Sample Collection Information and Parameters	<u>Sample Number</u>						
	MW1	MW2	Duplicate	MW3	MW4	MW5	Blank
Date	10/2/90	10/2/90	10/2/90	10/2/90	10/2/90	10/2/90	10/2/90
Time	1425	1530	1530	1515	1415	1630	1200
CLP Organic Traffic Report Number	EHW81	EHW82	EHW86	EHW83	EHW84	EHW85	EHW87
CLP Inorganic Traffic Report Number	MEGS78	MEGS79	MEGS83	MEGS80	MEGS81	MEGS82	MEGS84
Temperature (°C)	22	18	18	25	24	25	25
Specific Conductivity (µmhos/cm)	-	-	-	-	-	-	-
pH	6.74	6.93	6.93	6.70	6.70	6.92	6.25

Compound Detected  
(values in µg/L)

Volatile Organics

carbon disulfide	2J	--	--	--	--	3J	--
1,1-dichloroethane	--	--	--	--	--	1J	--
benzene	--	1J	1J	2J	--	5	--
4-methyl-2-pentanone	--	--	--	--	--	7J	--
toluene	--	--	--	--	--	5	--
chlorobenzene	14	55	56	22	--	2J	--
ethylbenzene	--	--	--	--	--	3J	--
xylenes (total)	--	--	--	2J	--	4J	--

Semivolatile Organics

1,2-dichlorobenzene	--	7J	12	--	--	--	--
---------------------	----	----	----	----	----	----	----

TICs+

caprolactam (105-60-2)	740J	690J	1,000J	390J	510J	--	--
(1,1'-bicyclohexyl)-2-one (90-42-6)	--	200J	220J	--	--	--	--

Table 4-2 (Cont.)

Sample Collection Information and Parameters	Sample Number						
	MW1	MW2	Duplicate	MW3	MW4	MW5	Blank
2-cyclohexylidene-cyclohexanone (1011-12-7)	--	97J	--	--	--	--	--
7-methoxy-2H-1-benzopyran-2-one (531-59-9)	--	--	51J	--	--	--	--
<u>Analyte Detected</u> (values in $\mu\text{g/L}$ )							
aluminum	365	--	--	--	--	--	--
antimony	26.3B	31.5B	--	18.7B	22.5B	--	--
arsenic	15.7	32.7	28.8	3.8B	--	--	--
barium	37.7B	69.9B	55.6B	98.4B	61.9B	--	--
calcium	151,000	174,000	171,000	112,000	98,000	--	126BJ
copper	13.8BJ	--	--	9.6BJ	8.2BJ	--	11.9BJ
iron	3,030	4,230	4,180	532	--	--	--
lead	3.8WJ	--	--	--	--	--	26.6
magnesium	25,100	39,500	39,200	18,100	20,000	--	35BJ
manganese	722	739	699	387	226	--	2.1B
nickel	10.5B	33.5B	31.9B	--	--	--	--
potassium	2,320B	6,940	7,020	1,800B	623B	--	--
sodium	71,000	71,400	70,400	11,600	987,000	--	524B
vanadium	49.9BJ	64.2	63.4	14.4BJ	660	--	--
zinc	28.5J	217	260	14.5BJ	77.4J	--	22.1
cyanide	R	R	R	R	R	R	R

-- Not detected.

+ TIC Chemical Abstracts Service (CAS) numbers, if available, are provided in parentheses.

- Specific conductivity was not obtained because the equipment malfunctioned.

Table 4-2 (Cont.)

COMPOUND QUALIFIER	DEFINITION	INTERPRETATION
J	Indicates an estimated value.	Compound value may be semiquantitative.

ANALYTE QUALIFIERS	DEFINITION	INTERPRETATION
B	Value is real, but is above instrument DL and below CRDL.	Value may be quantitative or semi-quantitative.
J	Value is above CRDL and is an estimated value because of a QC protocol.	Value may be semiquantitative.
W	Post-digestion spike for furnace AA analysis is out of control limits (35-115%), while sample absorbance is <50% of spike absorbance.	Value may be semiquantitative.
R	Results are unusable due to a major violation of QC protocols.	Analyte value is not usable.

## 5. DISCUSSION OF MIGRATION PATHWAYS

### 5.1 INTRODUCTION

This section presents discussions of data and information pertaining to potential migration pathways and targets of TCL compounds and TAL analytes that are possibly attributable to the Carstab site.

The five migration pathways of concern discussed are groundwater, surface water, air, fire and explosion, and direct contact.

### 5.2 GROUNDWATER

TCL compounds and TAL analytes were detected in monitoring well samples collected on-site. The TCL compounds included chlorobenzene (14 µg/L in MW1, 56 µg/L in the duplicate collected at location MW2, and 22 µg/L in MW3), and 1,2-dichlorobenzene (12 µg/L in the duplicate collected at location MW2). Monitoring wells MW1, MW2, and MW3 are all located near the area where drums containing hazardous waste are allegedly buried.

TAL analytes including arsenic (32.7 µg/L in MW2), manganese (739 µg/L in MW2), and vanadium (660 µg/L in MW4) were detected in on-site monitoring well samples. These TAL analytes appear to be common soil constituents in the area, because they were also detected in on-site soil samples at levels similar to background. However, there appears to be a correlation between concentrations of arsenic and manganese in some of the on-site monitoring wells and nearby soils. Soil sample S6 had the greatest concentration of vanadium (30.8 mg/kg) and was the soil sample collected closest to monitoring well MW4, which had

the greatest concentration of vanadium detected in the groundwater samples (660 µg/L).

TCL compounds and TAL analytes were detected at levels above background in soil/sediment samples, including chlorobenzene (12,000 µg/kg) and 1,2-dichlorobenzene (3,300,000 µg/kg) in sample S2 (see Table 4-1 for definitions and interpretations of qualifiers). These TCL compounds are among materials used on-site by Carstab Corporation (U.S. EPA 1980). However, the presence of these TCL compounds in the groundwater cannot be definitely attributed to the site because an upgradient monitoring well sample was not collected and because neighboring properties could also be sources.

A potential exists for TCL compounds and TAL analytes to migrate from the site to groundwater in the vicinity of the site. This potential is based on the following information.

- TCL compounds and TAL analytes were detected at concentrations above background in on-site soil samples.
- Drums of hazardous waste are allegedly buried on-site (E & E 1982; Gibbons 1991).
- There is no evidence that liners existed beneath the treatment pits while they were in use.

The potential for TCL compounds and TAL analytes to migrate from the site to groundwater in the vicinity of the site is affected by the geology in the area of the site. Geology in the area of the site consists of unconsolidated Quaternary glacial deposits of sands, gravels, silts, and clays. These glacial deposits are defined as extensive glacial river terraces and outwash plains, and floodplains (United States Department of Agriculture [USDA] 1982). Well logs of the area of the site indicate that the glacial material is composed of variously layered amounts of clay or sand and gravel (see Appendix H for well logs of the area of the site). In the area of the site, these deposits are approximately 156 to 178 feet thick, with Ordovician shale and limestone bedrock underlying the glacial material (E & E 1982).

Hydrological reports based on area well logs indicate that water levels in the area are 12 to 25 feet below the surface of the ground and that it is seldom possible to trace particular horizons from one well to another, even when wells are less than 1/4 mile apart. The Ohio Department of Natural Resources (ODNR) reports that in all of Mill Creek Valley north of Lockland, the region where the Carstab site is located, the upper glacial deposits and lower permeable bedrock are hydraulically connected and constitute a single aquifer of concern (AOC) (ODNR 1959; Ohio-Kentucky-Indiana Regional Council of Governments [OKIRCG] 1988). This AOC is a sole source aquifer, called the Great Miami Buried Valley Aquifer System. Groundwater flow within the region of the Great Miami Buried Aquifer System is generally from north to south, and drops at an average rate of 10.7 feet per mile (OKIRCG 1988). However, groundwater flow in the immediate vicinity of the site is generally from east to west, toward Mill Creek (E & E 1982).

According to OKIRCG, there are no private residential wells within a 3-mile radius of the site (OKIRCG 1988). Furthermore, private wells are virtually non-existent in Hamilton County, Ohio, because Cincinnati Water Works distributes water to most of the county. Cincinnati Water Works draws water from surface water intakes located in the Ohio River and from 10 municipal wells located near the Great Miami River. The former are located more than 8 miles from the site, and the latter are located approximately 12 miles from the site (Young 1991; Davis 1991). However, four municipalities (Glendale, Lockland, Reading, and Wyoming) draw water from well fields that are located within a 3-mile radius of the site. All well fields draw from the AOC. Glendale serves its population from two wells that are approximately 170 feet deep (Hauer 1991). Lockland serves its population from three wells that vary in depth from 160 to 220 feet (McKinney 1991). Reading serves its population from nine wells that are screened near the surface of the bedrock. Reading's water supply is filtered but not blended before distribution (Shorter 1991). Reading's well field is located less than 1/8 mile north of the site (E & E 1982). Reading currently uses nine wells. Since 1988, five of Reading's wells have been closed by OEPA because of volatile organic contamination (Bureau of National Affairs, Inc. [BNA]



1989; Kock 1990). Wyoming serves its population from six wells that vary in depth from approximately 170 to 220 feet (Wirtz 1991).

The population potentially affected by the migration of TCL compounds and TAL analytes from the site to groundwater consists of approximately 31,633 persons who obtain water from municipal wells located within a 3-mile radius of the site. This population was obtained by combining the populations served by the municipal water systems. Glendale has a population of approximately 2,400, and Lockland has a population of approximately 4,500 (Hauer 1991; McKinney 1991). Wyoming serves a population of approximately 10,000 and approximately 1,800 persons outside of the Wyoming corporate limits in Springfield Township (Cook 1991; Wirtz 1991). Reading serves a population of approximately 12,800 as well as 50 residences in the city of Blue Ash (Shorter 1991). The number of residences was then multiplied by a persons-per-household average of 2.65 for Hamilton County (U.S. Bureau of the Census 1982) to obtain a total of approximately 133 residents of Blue Ash served by the Reading municipal water system.

### 5.3 SURFACE WATER

No surface water samples were collected during the SSI of the Carstab site. However, a potential does exist for overland migration of TCL compounds and TAL analytes to Mill Creek, based on the following information.

- Mill Creek is adjacent to the west side of the site.
- Groundwater flow in the immediate area is to the west, toward Mill Creek.
- TCL compounds and TAL analytes were detected in on-site soil samples.
- TCL compounds were detected at levels above background in sediment sample S3, including ethylbenzene (82J  $\mu\text{g/kg}$ ), chlorobenzene (54J  $\mu\text{g/kg}$ ), 1,2-dichlorobenzene (670J

µg/kg), benzo[a]anthracene (370J µg/kg), bis(2-ethylhexyl)-phthalate (500J µg/kg), benzo[b]fluoranthene (540J µg/kg), and benzo[a]pyrene (440J µg/kg).

Mill Creek is not used as a source of drinking water, and no surface water intakes are located within a 3-mile radius of the site (Davis 1991). Therefore, there is no target population for surface water migration. However, Mill Creek is used for recreational purposes (Gibbons 1991b).

#### 5.4 AIR

A release of TCL compounds or TAL analytes to the air was not documented during the SSI of the Carstab site. During the reconnaissance inspection, FIT site-entry instruments (OVA 128, radiation monitor, colorimetric monitoring tubes for cyanide, oxygen meter, explosimeter) did not detect levels above background concentrations at the site. In accordance with the U.S. EPA-approved work plan, further air monitoring was not conducted by FIT.

A potential does not exist for TCL compounds and TAL analytes to migrate from the site via windblown particulates because the site is covered with concrete, asphalt, and vegetation.

#### 5.5 FIRE AND EXPLOSION

A fire and explosion occurred on-site in 1969 (Beiser, Hanley, and Schaaf 1990; Hollmeyer 1991). The fire and explosion occurred during normal plant operations (Hollmeyer 1991). According to FIT observations and site-entry equipment readings, no potential for fire or explosion existed at the site at the time of the SSI.

#### 5.6 DIRECT CONTACT

Prior to 1978 an unknown number of employees were exposed to dimethyltin dichloride (U.S. EPA 1986; Gibbons 1991). The building where the exposure took place was closed and another processing building was built at another location on-site (U.S. EPA 1986).

The potential for the public to come into direct contact with TCL compounds and TAL analytes detected on-site is minimal because fencing

completely surrounds the site and the gate is guarded 24 hours per day. There are approximately 180 employees who can potentially come into direct contact with TCL compounds and TAL analytes detected on-site (Beiser, Hanley, and Schaaf 1990).

Sediment sample S3 was collected adjacent to the northwest corner of the site, on the east bank of Mill Creek. Analysis of this sample detected concentrations of TCL compounds and TAL analytes above background. The population within a 1-mile radius of the site potentially affected through direct contact with TCL compounds and TAL analytes is approximately 12,114. The population was calculated by using a planimeter. This was accomplished by measuring the total area of the cities of Evendale, Lincoln Heights, Lockland, and Reading to obtain a persons-per-unit area value for each city. The area of each municipality outside of the 1-mile radius was then multiplied by the appropriate value and subtracted from the total population estimate.

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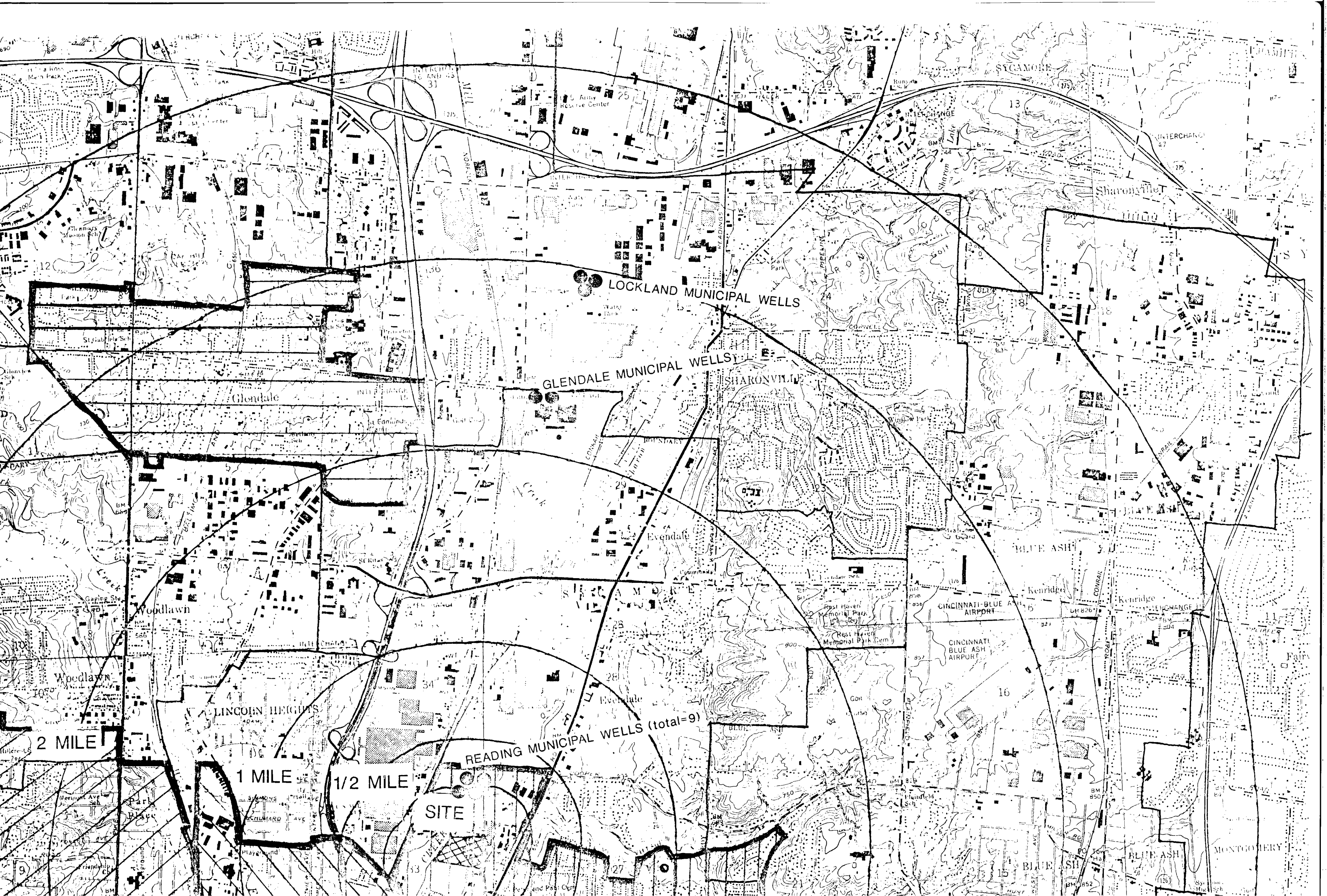
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6826:2

APPENDIX A

SITE 4-MILE RADIUS MAP







LOCKLAND MUNICIPAL WELLS

GLENDALE MUNICIPAL WELLS

SHARONVILLE

READING MUNICIPAL WELLS (total=9)

LINCOLN HEIGHTS

SITE

1 MILE

1/2 MILE

2 MILE

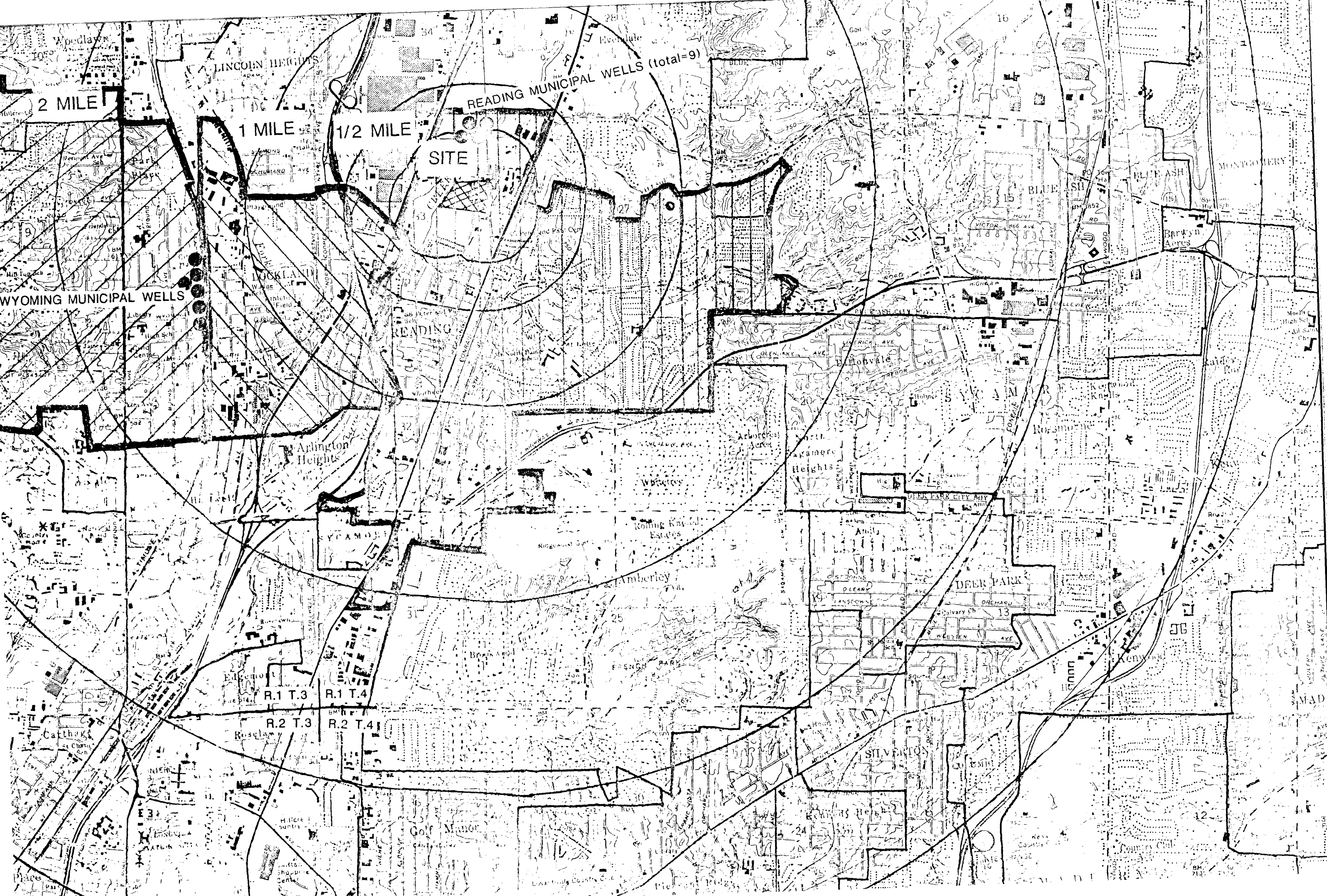
3 MILE

4 MILE

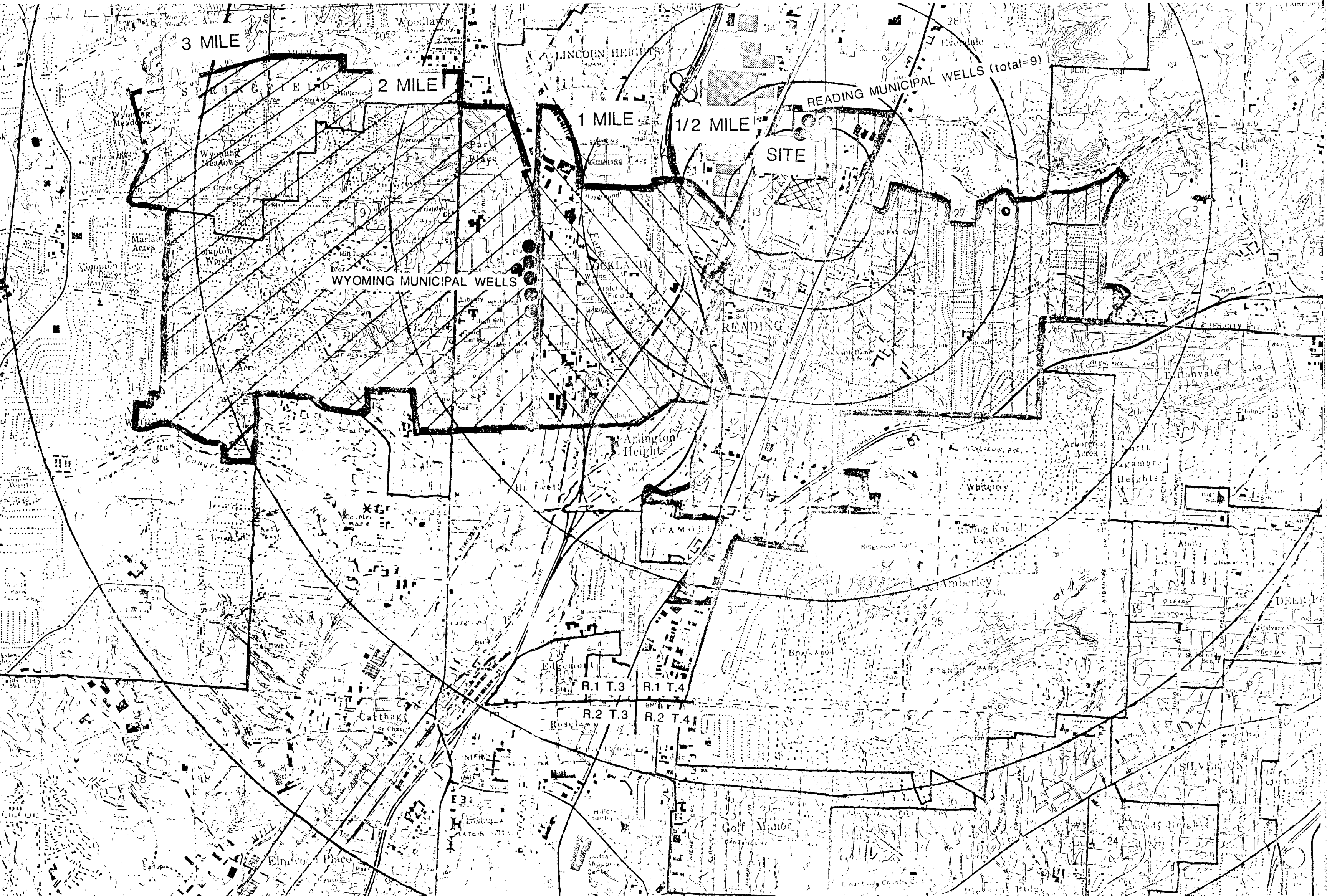
SPRINGDALE

Glendale

Woodlawn



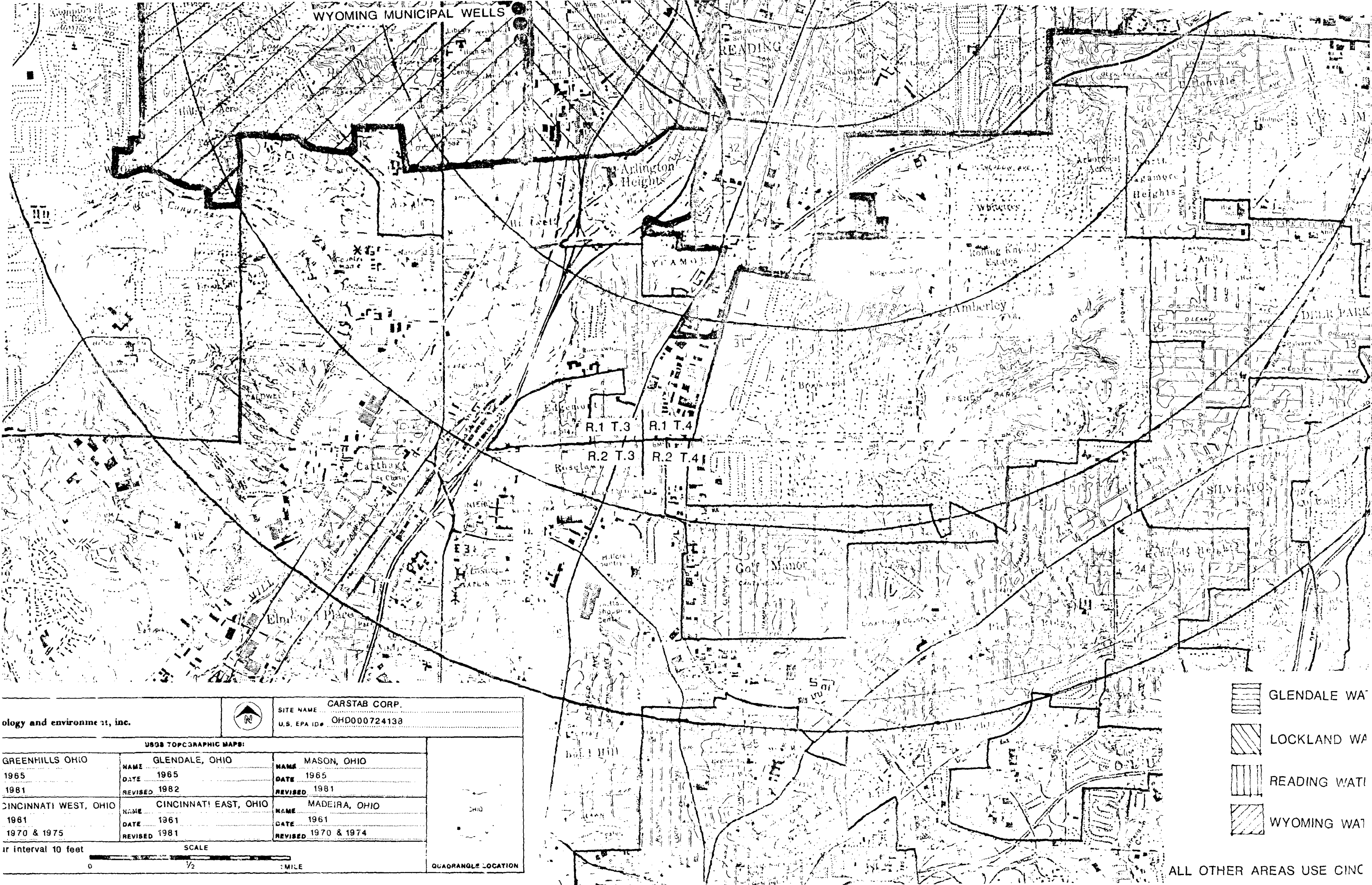





CARSTAB CORP.	
OHD000724133	
ON, OHIO	CHIO
5	
81	
DEIRA, OHIO	
1	
0 & 1974	
QUADRANGLE LOCATION	

ALL OTHER AREAS USE CINCINNATI WATER WORKS WATER





ology and environment, inc.



SITE NAME CARSTAB CORP.

U.S. EPA ID# OHD000724138





USGS TOPOGRAPHIC MAPS:					
GREENHILLS OHIO		GLENDALE, OHIO		MASON, OHIO	
1965	NAME	1965	NAME	1965	NAME
1981	DATE	1982	DATE	1981	DATE
	REVISED		REVISED		REVISED
CINCINNATI WEST, OHIO		CINCINNATI EAST, OHIO		MADEIRA, OHIO	
1961	NAME	1961	NAME	1961	NAME
1970 & 1975	DATE	1981	DATE	1970 & 1974	DATE
	REVISED		REVISED		REVISED

ir interval 10 feet

SCALE

0 1/2 1 MILE

QUADRANGLE LOCATION

-  GLENDALE WA
-  LOCKLAND WA
-  READING WAT
-  WYOMING WAT

ALL OTHER AREAS USE CINC

APPENDIX B

RAW MATERIALS, INTERMEDIATE PRODUCTS,  
AND FINISHED PRODUCTS AT THE CARSTAB SITE

Purchased Materials	Intermediate Products	Finished Products*
Mineral Oil	Stannic Chloride	Car-A-Van 6110
Liquid Lubricant	Advastab TM-188	SOA
Alpha Olefins	DMTDCL 20% Mono Neat	Beta-Chlor 33
Tributylphosphine	DMTDCL 90% Mono Neat	Pave 100
Diethyl Hydrogen Phosphite	Intermediate C-2545	Pave 192
Dibutyl Hydrogen Phosphite	Intermediate C-2190	Pave Bond
Triphenylphosphine	Advastab TM-593D	Pave Bond Special
Sodium Sulphydrate-45 Solution	Advastab TM-593	Pave Bond LP
Dimethyl Thiodipropionate	Advastab TM-181X	Pave Bond AP
Dilauryl Tiodipropionate	Advastab TM-303	Pave Bond AP
Ethylenediamine 99%	Intermediate C-2496	Carstab BA-2000
Residual Triethanolamine	Advastab TM-599	Pave Bond Advantage
Dimethylaminopropylamine	Pave Bond Conc.	Pave Bond PS
Polyethylene Polyamines	Extended Residual Triamines	Pave Bond Lite
Residual Ethyleneamine Stream	Pave Bond LP Conc.	Pave Bond Delta
Residual Triamines HIBV	ETPPI Wet	Advawax 140
Wet Polyamine Residue	BTPPCL Wet	Advawax WL-227
High BV Amine Stream	Asphalt Diluent Mix	Advawax WL-229

Purchased Materials	Intermediate Products	Finished Products*
Residual Triamines LOBV	Sodium Sulfhydrate-30%	Advapak WL-229
EDTA Liquid	T0-8	Advapak ML-1325
Trimethylamine	T0-26	Advawax 240
Ethoxylated Poly- amine Res.	MP-26	Advawax 2610
Benzylchloride	2-MEO	Advawax 280
N-Butylchloride	Treated Unfinished Wax	Advawax 290
Ethyl Chloride	--	Advawax 450
Methyl Chloride	--	Carstab DLTDP
Beta Chlor	--	Carstab DSTDP
Bisphenol AF	--	Carstab DSTDP-F
P-Chlorophenyl- sulfone	--	Advastab TM-929
Ethyl Iodide	--	Advastab TM-181FSE
Zinc Octoate	--	Advastab TM-181FSEM
Acetic Acid	--	Advastab TM-709
Acetic Anhydride	--	Advastab TM-404
Pelargonic Acid	--	Advastab TM-181
Serasic Acid	--	Advastab TM-181-S
Lauric Acid	--	Advastab TM-181-FS
Tall Oil Acid Heads	--	Carstab TH-811
Stearic Acid 1 TV Max.	--	Advastab TM-181-MS
Stearic Acid 95%	--	Advastab TM-2080
Stearic Acid 1.75 IV Max.	--	Advastab TM-1870



Purchased Materials	Intermediate Products	Finished Products*
Stearic Acid LS Specif.	--	Advastab TM-181-FSM
Double-Distilled Oleic Acid	--	Advastab TM-948
Single-Distilled Fatty Acid	--	Advastab TM-945
SD HI Rosin TA-FA	--	Advastab C-2368
Distilled Tall Oil Acid HI Rosin	--	Advastab TM-1815
Maleic Anhydride	--	Advastab TM-182
Thioglycolic Acid 97% Min.	--	Advastab TM-592D
B-Mercaptopropionic Acid	--	Advastab TM-592
Para-Toluene Sulfonic Acid	--	Advastab TM-692
Cyclohexanone Cracking Res.	--	Advastab TM-602
Methyl Iso-Butyl ketone	--	Advastab TM-692V
Glycerine, 96%, LS Specif.	--	Advastab TM-694
Choice White Grease	--	Advastab TM-697
Bleached Fancy Tallow	--	Advastab TM-696
Crude Cottonseed Oil	--	Advastab TM-281
Glyceryl Mono stearate	--	Advastab C-2325
Methyl Esters	--	Advastab C-2354

Purchased Materials	Intermediate Products	Finished Products*
Glyceryl Monoleate	--	Advastab C-2360
Methyl Ester Fatty	--	Advastab TM-521
Iso-Octylthioglyco- late	--	Advastab C-2388
T0-9	--	Advastab TM-723
Isooctyl Tallate Epoxidized	--	Advastab TM-281SP
Methanol	--	Advastab TM-522
Isopropanol Anhy. 99%	--	Advastab TM-281-IM
N-Butanol	--	Advastab TM-2520
Iso-Octanol	--	Advastab TM-2582
2-Ethyl Hexanol	--	Advastab WS-379
Lauryl Alcohol	--	Advastab WS-499
Stearyl Alcohol	--	Advastab WS-599
Myristyl Alcohol	--	TPP
2-Mercaptoethanol	--	DMTDCL 20% Mono Sol.
Glycerine	--	DMTDCL 20% Mono Neat
Propylene Glycol	--	BTPPCL
Diethylene Glycol	--	ETPPI
Di-T-Butyl Hydro- quinone	--	TBPCL 90% in Water
Bisphynol A	--	ETPPCL 50% PG
Butylated Hydroxy- toluene	--	TBPAAC-70% in Methanol
Butylated Bisphenol A	--	Advastab C-2327

Purchased Materials	Intermediate Products	Finished Products*
E Glycol Methyl Ether	--	Advastab C-2614
Tetraethyleneglycol BTTMS	--	Advastab C-2560
Polyethylene Glycol BTTMS	--	Advastab C-2601
Glycol Ethers Residues	--	Advapak SLS-1000
Tetraethylene Glycol	--	Advastab LS-203
Epoxidized Soya Oil	--	Advastab LS-203HP
Petroleum Sulfonate	--	Advastab LS-203HF
Nonionic Surfactant	--	Advapak MS-60
Paraffin Wax 155F FDA	--	Advastab MS-60
Paraffin Wax- unfiltered	--	Advapak LS-203
Polyethylene Wax	--	Advapak TM-70S
Oxidized Polyethylene Wax	--	Advastab TM-790
Perfume	--	Advawax ML-2516
Unfinished Paraffin Wax	--	Advastab C-2584
Silicone Defoamer	--	Advapak ML-2516
Vanillin USP	--	Advastab C-2540
Dibutyltin Oxide	--	Advapak C-2540
Diocetylinoxide	--	--
Mono-N-Octyltin Oxide	--	--
Tetraisopropyl Titanate	--	--

Purchased Materials	Intermediate Products	Finished Products*
Phosphoric Acid	--	--
Phosphorous Acid	--	--
Aqueous Ammonia	--	--
Anhydrous Ammonia	--	--
Sodium Hydroxide 50%	--	--
Potassium Hydroxide 45%	--	--
Calcium Hydroxide	--	--
Magnesium Hydroxide	--	--
Sodium Hypochlorite	--	--
Sodium Sulfate	--	--
Soda Ash	--	--
Ground Limestone	--	--
Copper Chloride Sol. 10% Cu	--	--
55% Copper Chloride Sol.	--	--
Cupric Chloride Dihydrate Water	--	--
Hydrogen Peroxide 50%	--	--
Hydrogen Peroxide 10%	--	--
Chlorine	--	--
Sulfur	--	--
Carbon Dioxide	--	--
Tin Ingots	--	--
Tin Molten	--	--

Purchased Materials	Intermediate Products	Finished Products*
LS Packing Cost	--	--
Activated Carbon Norite FQA	--	--
Activated Carbon	--	--
Diatomaceous Earth Dicalite	--	--
Bentonite Clay Filtrol G4	--	--
Diatomaceous Earth Filter Cel	--	--
Diatomaceous Earth FW50	--	--

\* Finished products are trade names. Most are stabilizers for PVC plastics or asphalt bonding materials.

Source: Schaaf 1991.

APPENDIX C  
HAZARDOUS WASTES GENERATED AT THE CARSTAB SITE

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
1981	Spent non-halogenated solvents	F005	48 T
	Recovered Methanol	U154	171 T
	Spent Solvents and Residues	D001	3 T
	Acid Solvent Residues	D002	68 T
	Recovered Acid Layers and Residues	D002	447 T
	Scrubber Solutions	D003	26 T
1982	Spent Solvents and Residues from chemical processes - Ignitable	D001	135 T
	Scrap Residue from chemical product manufacture - EP Toxic	D008	129 T
	Spent Non-halogenated Solvents from chemical processes	F005	121 T
	Recovered Acid layers from chemical processes - Corrosive	D002	62 T
	Scrubber Solution from Pollution Control - Reactive	D003	40 T
	Acid Solvents and Residues from chemical Processes Corrosive	D001	38 T
	Laboratory Wastes from Quality and Research Work	D002, D003	8 T

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
1983	Scrap Residues from chemical Plant processes - EP Toxic	D008	112 T
	Filter Press Papers and Residues from chemical plant processes - EP Toxic	D004, D008	108 T
	Spent Mixed Solvents and Residues from chemical plant processes - Ignitable	D001	60 T
	Recovered Acid Layers from chem- ical plant processes - Corrosive	D002	141 T
	Laboratory Wastes from Quality Control and Research Work - Cor- rosive	D002, D003	14 T
	Scrubber Solutions from Pollution Control Processes - Reactive	D002, D003	29 T
	Spent Non-halogenated Solvents from chemical plant processes	F005	70 T
	Spent Acidic Solvents and Residues from chemical plant processes - Ignitable	D001, D002	7 T
	Spent Solvents and Residues from chemical plant processes - Ignitable	D001	12 T
1984	Process Scrap Residue - EP Toxic	D008	89 T
	Filter Press Papers and Residues - EP Toxic	D004, D008	40 T
	Research and QC Laboratory Wastes - Corrosive	D002, D004	11 T
	Acid Press Cakes and Filter Cartridges - Corrosive	D002	10 T
	Spent Acid Solvents and Residue - Ignitable	D001, D002	19 T



Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
1985	Recovered Acid Layers Corrosive	D002	65 T
	Scrubber Solution Pollution Control - Reactive	D003	46 T
	Spent Non-halogenated Solvents	D001, D002	7 T
	Recovered Methanol	D001, F005	47 T
	Spent Solvents and Residues	D001	6 T
	Acid Solvents and Residues	D001, D002	18 T
	Recovered Acid Layer	D002	36 T
	Press Papers and Residues	D004, D008	25 T
	Press Papers and Residues	D002	4 T
1986	Process Scrap Residue - EP Toxic	D008	106 T
	Research and QC Laboratory Wastes	D004, D008	9 T
	Press Papers and Residues	D002	25 T
	Press Papers and Residues	D004, D008	44 T
	Process Scrap Residue - EP Toxic	D004, D008	78 T
	Acid Solvents and Residues	D001, D002	22 T
	Laboratory Wastes from QC and Research	D004, D008	4 T
	Laboratory Wastes from QC and Research	D002	65 T
	Recovered Methanol	D001, F005	52 T
	Spent Solvents and Residues	D001	11 T
	Recovered Acid Layer	D002	24 T

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
1987	Sulfur Monochloride and Soda Ash	D003	0.2 T
	Recovered Acid Layers	D002	49 T
	Waste Recovered Methanol	D001, F003	72 T
	Waste Spent Solvents and Residues	D001	8 T
	Waste Acid Solvents and Residues	D001, D002	12 T
	Waste Scrubber Solution	D002, D003	58 T
	Waste Press Papers and Residues	D002	19 T
	Waste Press Papers and Residues	D004, D008	57 T
	Laboratory Wastes from QC and Research	D004, D008	2 T
1988	Laboratory Wastes from QC and Research	D002	20 T
	Waste Acetic Acid Layer	D002	20 T
	Waste Press Papers and Residues	D008	65 T
	Waste Scrubber Solution	D002, D003	12 T
	Waste Acid Solvents and Residues	D001, D002	29 T
	Waste Recovered Methanol	D001	47 T
	Waste Spent Solvents and Residues	D001	6 T
	Waste Press Papers and Residues	D002	7 T
	Laboratory Waste from QC and Research	D002	1,600 P
	Laboratory Waste from QC and Research	D002, D003	800 P

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
1989	Laboratory Waste From QC and Research	D002, D003, D008	8 T
	Laboratory Waste from QC and Research	D002	1 T
	Waste Spent Solvents and Residues	D001	1,600 P
	Waste Scrubber Solution	D002, D003	400 P
	Waste Acid Solvent Solid	D001, D002	2 T
	Ignitable and Corrosive Lab Packs Retainer Samples from Quality Assurance - Liquids and Solids	D001, D002	200 P
	Corr. and React. Sulfide Scrubber Cleanout Solid	D002, D003	23 T
	Corr. EP Toxic Methyltin Chlorides Solid/Liquid	D002, D004, D008	2 T
	Flam. Liq. Spent IPA and Phosphonium Halides	D001	2,800 P
	Flam. Liq. Isopropanol Spill Cleanup W/Clay AB	F002	800 P
	Flammable Liquid Methanol By-product Liq./Solids	D001	1,200 P
	EP Toxic Methyltin Chloride Spill Cleanup with Soda Ash	D004	400 P
	Flammable Liquid Methanol By-product	F002, F003, F005	46 T
	Flam. Liq. Spent Isopropanol and Phosphonium Salt	F002, F003, F005	7 T
	Flammable Liq. Scrap Mercapto-ethylester	D001	4 T
	Non Req. Hydrocarbon Oils Shipped W/ "F" Waste	F002, F003, F005	4 T

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
	Spent Lab Solvents-Titrations- Clean Lab Ware, Etc. Acetone Toluene-IPA-Meoh-Xylene-<1% HOC	D002 F002, F003, F005	4 T
	EP Toxic Methyltinooctylthio- glycolate Press Cake Solid	D008	53 T
	Flam.-Phosphonium Acetate-NH <sub>4</sub> Cl Nutsche Solid	D001, D002	5 T
	Flam. Acetic A. Phosphonium Acetate Distil. Liq.	D001	5 T
	Corrosive Sodium Hydroxide Spill Cleanup Solid	D002	5,200 P
	Flam. Liq. Spent IPA and Phosphonium Halides L and S	D001	2 T
	Flam. Phosphonium Halides Nutsche Cake, Solid	D001	1 T
	Corr. EP Toxic Methyltin Chloride Sat. Insulation	D002, D008	1,200 P
	EP Toxic Spill Cleanup Tank Truck Dock Solid	D008	800 P
	Corr. Lab Pack Chem. Group C and F Discarded L and S	D002	800 P
	Corr. EP Tox. Methyltin Chloride Filters Solid	D002, D004	5,200 P
	EP Toxic Mathultinoct-Thioglycolate Presscake Solid	D008	4,000 P
	EP Toxic Methyltinchloride Spill Cleanup Na <sub>2</sub> CO <sub>3</sub> Sol.	D004	2,000 P
	EP Toxic Stannous Chloride Cleanout Solid	D008	2,000 P

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
1990	Corr. Methyltinchloride Spill Cleanup Solid	D008 D002, D007	1,200 P
	Corr. Methyltinchloride Spill Cleanup Solid	D002	400 P
	EP Toxic Organotinmercaptide Press Cake Solid	D008	23 T
	Ignitable and Corrosive Lab Packs Retainer Samples from Quality Assurance. Liquids and Solids	D001, D002	200 P
	Ign. Liq. Spent Isopropanol and Phosphonium Salt	D001, D002	4 T
	Ign. Liq. Dist. Spent Propyl- ene Glycol Solvent	D001	455 P
	Ign. Liq. Spent Lab. Solv. Acetone, Toluene, Others.	D001 F001, F005	4 T
	Ign. Liq. Spent Xylene, Equipment Cleanout	D001, F003	1 T
	Ign. Liq. Lab Pack Pyridine from R and D Routine Wk.	D001 D008, U196	1 P
	Lab Packs Corrosive, Reactive, EP Toxic from Routine Research and Development Work. Solids and Liquids	D002, D003, D005, D006, D008, D010, D011	200 P
	Ign. Phosphonium Acetate-NH <sub>4</sub> C1 Nutsche Solid	D001, D002	1,800 P
	Ign. Acetic A.-Phosphonium Ac. Dist. Res. Liquid	D001, D002	2,068 P
	Ign. Acetic A.-Phosphonium Ac. Dis. Res. Liquid	D002	2,205 P
	Corr. EP Toxic Methyltinchloride Sat. Ins. Solid	D002, D008	105 P

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
	Flam. Liq. Spent Isopropanol and Phosphonium Salt	D001	16 T
	Ignitable Acetic Acid Distillates	D001	6 T
	Ign. Acetic A.-Phosphonium Ac. Dist. Res. Liquid	D001, D002	4 T
	Ignitable Liquid methanol By- product	D001	41 T
	Spent Xylene Spill Cleanup Equip. Cleanup, Solid	F003	396 P
	Corr. EP Tox. Methyltinchloride Filters, Solid	D002, D004 D007, D008	3 T
	Corr. EP Tox. Methyltincl. Sat. Insul. Solid	D002, D006	378 P
	Lab Packs Ign. Corr. EP Toxic Routine Res. and Develop. Work. Liquids and Solids	D001, D002 D003, D004	417 P
	Corrosive Methyltin Chloride Filters, Solid	D002	1,318 P

\* T = tons; P = pounds.

Source: Schaaf 1991

APPENDIX D  
DISCHARGE PERMITS AT THE CARSTAB SITE

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Agency	Permit No.	Description*	Expiration Date
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Sewer Permit:

Metropolitan Sewer District (Cincinnati)	MIL-026	Wastewater Discharge Permit	11/05/91
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Air Permits:

Ohio EPA	B001	Boilers	Registration
Ohio EPA	P004	B-27 Dev. Activities	Registration
Ohio EPA	P006	B-1 Wax Processing	Registration
Ohio EPA	P009	B-3/3A Tin Mercaptides	3/21/94
Ohio EPA	P010	B-3/3A Organo Sulfur	3/21/94
Ohio EPA	P011	B-3 Thioester	3/21/94
Ohio EPA	P012	B-3A Lubricating Stabilizer	Registration
Ohio EPA	P016	B-6 Phosphonium Compounds	3/21/94



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Agency	Permit No.	Description*	Expiration Date
<hr/>			
Ohio EPA	P017	B-12 Organotin Intermediates	6/8/92
Ohio EPA	P018	B-16 L.S. Spray Tower	12/26/93
Ohio EPA	P019	B-11 Organotin Intermediates	6/8/92
Ohio EPA	P020	B-27 P.E. Oxidation	Registration
Ohio EPA	P021	B-28 Spray Tower & R-2705	6/24/91
Ohio EPA	P022	T-9 Asphalt Additive Prod.	Registration
Ohio EPA	P023	T-9108 Asphalt	Registration

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\* B = building; T = tower.

Sources: Schaaf 1991

APPENDIX E

U.S. EPA FORM 2070-13



# Site Inspection Report



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

IDENTIFICATION  
01 STATE OH 02 SITE NUMBER 0000724138

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site) Carstab Corp.  
02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER 2000 West Street  
03 CITY Reading  
04 STATE OH 05 ZIP CODE 45215 06 COUNTY Hamilton  
07 COUNTY CODE 061 08 CONG DIST 02  
09 COORDINATES  
LATITUDE 39° 14' 00" LONGITUDE 84° 25' 30"  
10 TYPE OF OWNERSHIP (Check one)  
☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL  
☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION 10/18/90  
MONTH DAY YEAR  
02 SITE STATUS  
☒ ACTIVE ☐ INACTIVE  
03 YEARS OF OPERATION  
1949 Present UNKNOWN  
BEGINNING YEAR ENDING YEAR  
04 AGENCY PERFORMING INSPECTION (Check all that apply)  
☐ A. EPA ☒ B. EPA CONTRACTOR Ecology & Environment, Inc. (Name of firm)  
☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR (Name of firm)  
☐ E. STATE ☐ F. STATE CONTRACTOR (Name of firm)  
☐ G. OTHER (Specify)

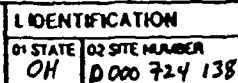
05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Cortney Schmidt	Water Resources Manager	Ecology and Environment, Inc.	(312) 663-9415
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Nathan Russell	Geologist	Ecology and Environment, Inc.	(312) 663-9415
Rod Hackler	Environmental Engineer	Ecology and Environment, Inc.	(312) 663-9415
John Nordine	Geologist	Ecology and Environment, Inc.	(312) 663-9415
Mike Felts	Natural Resources Manager	Ecology and Environment, Inc.	(312) 663-9415
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
Glenn Schaaf	Manager, Health, Safety, and Environment	2000 West Street, Reading, OH	(513) 733-2132
Bruce E. Beiser	Plant Manager	2000 West Street, Reading, OH	(513) 733-2179
John Hanley	Senior Administrator Environment and Product Safety	Unknown	Unknown ( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)  
☒ PERMISSION ☐ WARRANT  
18 TIME OF INSPECTION 8:10 am  
19 WEATHER CONDITIONS Clear, upper 60's to mid 70's.

IV. INFORMATION AVAILABLE FROM

01 CONTACT Jeanne Griffin  
02 OF (Agency/Organization) U.S. EPA  
03 TELEPHONE NO. (312) 886-3007  
04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM Mark Dunnigan  
05 AGENCY U.S. EPA/FIT  
06 ORGANIZATION Ecology and Environment, Inc.  
07 TELEPHONE NO. (312) 663-9415  
08 DATE 3/5/91  
MONTH DAY YEAR



<input checked="" type="checkbox"/> A. TOXIC	<input type="checkbox"/> E. SOLUBLE	<input type="checkbox"/> I. HIGHLY VOLATILE
<input type="checkbox"/> B. CORROSIVE	<input type="checkbox"/> F. INFECTIOUS	<input type="checkbox"/> J. EXPLOSIVE
<input type="checkbox"/> C. RADIOACTIVE	<input type="checkbox"/> G. FLAMMABLE	<input type="checkbox"/> K. REACTIVE
<input checked="" type="checkbox"/> D. PERSISTENT	<input type="checkbox"/> H. IGNITABLE	<input type="checkbox"/> L. INCOMPATIBLE
		<input type="checkbox"/> M. NOT APPLICABLE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	Unknown		
OLW	ONLY WASTE	Unknown		Refer to Site History
SOL	SOLVENTS	Unknown		narrative is section 2.3;
PSD	PESTICIDES	Unknown		TCL compounds and TAL analytes
OOC	OTHER ORGANIC CHEMICALS	Unknown		noted in soil/sediment and
IOC	INORGANIC CHEMICALS	Unknown		groundwater samples collected
ACD	ACIDS	Unknown		on-site.
BAS	BASES	Unknown		
MES	HEAVY METALS	Unknown		

[illegible]

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	Refer to Table		FDS		
FDS	3-1 for list		FDS		
FDS	of feedstocks purchased		FDS		
FDS	by Constab.		FDS		

Laboratory Analytical Data  
E&E Chicago file information



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I IDENTIFICATION  
01 STATE OH 02 SITE NUMBER 000 724 138

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION 02 ☒ OBSERVED (DATE: 10/2/90) ☐ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: 31,633 04 NARRATIVE DESCRIPTION

See Section 5.2 Narrative

01 ☒ B. SURFACE WATER CONTAMINATION 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: 0 04 NARRATIVE DESCRIPTION

See Section 5.3 Narrative

01 ☐ C. CONTAMINATION OF AIR 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

See Section 5.4 Narrative.

01 ☒ D. FIRE/EXPLOSIVE CONDITIONS 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☒ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: 0 04 NARRATIVE DESCRIPTION

See Sections 2.3 & 5.5 Narrative

01 ☒ E. DIRECT CONTACT 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: ~12,294 04 NARRATIVE DESCRIPTION

See Section 5.6 Narrative

01 ☒ F. CONTAMINATION OF SOIL 02 ☒ OBSERVED (DATE: 10/1/90) ☐ POTENTIAL ☐ ALLEGED  
03 AREA POTENTIALLY AFFECTED: ~26 Acres 04 NARRATIVE DESCRIPTION

See Table 4-1, Analytical Summary

01 ☒ G. DRINKING WATER CONTAMINATION 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: 31,633 04 NARRATIVE DESCRIPTION

See Section 5.2 Narrative

01 ☒ H. WORKER EXPOSURE/INJURY 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 WORKERS POTENTIALLY AFFECTED: ~180 04 NARRATIVE DESCRIPTION

See Section 5.6 Narrative

01 ☒ I. POPULATION EXPOSURE/INJURY 02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: 31,633 04 NARRATIVE DESCRIPTION

See Section 5 Narrative



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION  
E1 STATE OH E2 SITE NUMBER 000 724 138

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED

A potential exists for plant life to become affected by the intake of TCL compounds and/or TAL analytes through root systems of vegetation on potentially contaminated soils.

01 ☒ K. DAMAGE TO FAUNA  
04 NARRATIVE DESCRIPTION (include names of species)

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED

Potential exists for animal life in the area to be affected by TCL compounds and/or TAL analytes detected on site.

01 ☒ L. CONTAMINATION OF FOOD CHAIN  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED

Potential exists through animals to humans

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES

(Spills, Leaking Drums, Leaking Tanks)

02 ☒ OBSERVED (DATE: 10/1/90) ☐ POTENTIAL ☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: 31,633

04 NARRATIVE DESCRIPTION

TCL compounds and TAL analytes were detected in on-site soil samples and on site monitoring wells. See sections 4 & 5.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☐ ALLEGED

None observed or documented

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☒ POTENTIAL ☐ ALLEGED

Site is located in urbanized area.  
Site has sewer discharge permit. See sections 2 & 5.

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING  
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: \_\_\_\_\_) ☐ POTENTIAL ☒ ALLEGED

See sections 2 & 5.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

None

III. TOTAL POPULATION POTENTIALLY AFFECTED: 31,633

IV. COMMENTS

The site is an active chemical manufacturing plant. Hazardous wastes (liquids & solids) generated are temporarily stored on-site. An NPL site immediately borders the site on the north.

V. SOURCES OF INFORMATION (cite specific references, e.g., state files, sample analysis reports)

E&E Chicago file information



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION  
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

IDENTIFICATION

01 STATE 02 SITE NUMBER  
OH D 000 724 138

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
<input type="checkbox"/> A. NPDES				
<input type="checkbox"/> B. UIC				
<input checked="" type="checkbox"/> C. AIR	* Numerous air	permits issued → see	Table 2-1.	
<input checked="" type="checkbox"/> D. RCRA	Unknown	11/17/90	Unknown	Part A RCRA permit closed
<input checked="" type="checkbox"/> E. RCRA INTERIM STATUS	Unknown	Unknown	Unknown	Currently under interim status
<input type="checkbox"/> F. SPOC PLAN				
<input type="checkbox"/> G. STATE (Specify)				
<input type="checkbox"/> H. LOCAL (Specify)				
<input checked="" type="checkbox"/> I. OTHER (Specify) Sewer discharge	ML-026	11/5/1990	11/5/1991	issued by metropolitan sewer
<input type="checkbox"/> J. NONE				District of Cincinnati → Refer to

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE	04 TREATMENT (Check all that apply)	05 OTHER
<input checked="" type="checkbox"/> A. SURFACE IMPOUNDMENT	6 pits (unknown dimensions ~6 ft deep)	abandoned & covered	<input type="checkbox"/> A. INCINERATION	<input checked="" type="checkbox"/> A. BUILDINGS ON SITE
<input checked="" type="checkbox"/> B. PILES	~ 30	20 lb bags	<input type="checkbox"/> B. UNDERGROUND INJECTION	
<input checked="" type="checkbox"/> C. DRUMS, ABOVE GROUND	~ 150	55 GAL	<input type="checkbox"/> C. CHEMICAL/PHYSICAL	
<input checked="" type="checkbox"/> D. TANK, ABOVE GROUND	~ 73	1,000-400,000 GAL	<input type="checkbox"/> D. BIOLOGICAL	~ 20
<input type="checkbox"/> E. TANK, BELOW GROUND			<input type="checkbox"/> E. WASTE OIL PROCESSING	06 AREA OF SITE
<input type="checkbox"/> F. LANDFILL			<input checked="" type="checkbox"/> F. SOLVENT RECOVERY	~ 25 site
<input type="checkbox"/> G. LANDFARM			<input type="checkbox"/> G. OTHER RECYCLING/RECOVERY	~ 375 total none
<input type="checkbox"/> H. OPEN DUMP			<input checked="" type="checkbox"/> H. OTHER Acid Neutralization (Specify)	
<input checked="" type="checkbox"/> I. OTHER Cardboard "Cecos" (Specify)	boxes ~ 25	1 cu. yd.		

07 COMMENTS

FIT observed piles of scrap metal in the northwest section of the site. At least two tractor-trailer units were on site (near the main parking lot).

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)  
☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, Diking, LINERS, BARRIERS, ETC.

Constab has a slurry wall to contain spills where hazardous wastes are temporarily stored. A drainage collection system has been installed along the western edge of the site to collect any soil contaminants (leachates). Materials collected by these systems are piped into the Cincinnati metropolitan sewer district. Tank farms have spill/rupture dikes surrounding them.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☒ NO

02 COMMENTS

Site is entirely fenced and guard mans gate 24 hours a day.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analyses, reports)

E&E Chicago file information





POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE OH 02 SITE NUMBER 000 724 138

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)			02 STATUS			03 DISTANCE TO SITE
	SURFACE	WELL	ENDANGERED	AFFECTED	MONITORED	
COMMUNITY	A. <input type="checkbox"/>	B. <input checked="" type="checkbox"/>	A. <input type="checkbox"/>	B. <input checked="" type="checkbox"/>	C. <input type="checkbox"/>	A. <u>1/8</u> (mi)
NON-COMMUNITY	C. <input type="checkbox"/>	D. <input type="checkbox"/>	D. <input type="checkbox"/>	E. <input type="checkbox"/>	F. <input type="checkbox"/>	B. <u>UNKNOWN</u> (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☒ B. DRINKING  
(Other sources available)  
COMMERCIAL, INDUSTRIAL, IRRIGATION  
(No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION  
(Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER <u>27,810</u>	03 DISTANCE TO NEAREST DRINKING WATER WELL <u>1/8</u> (mi)			
04 DEPTH TO GROUNDWATER <u>~17</u> (ft)	05 DIRECTION OF GROUNDWATER FLOW <u>West</u>	06 DEPTH TO AQUIFER OF CONCERN <u>~17</u> (ft)	07 POTENTIAL YIELD OF AQUIFER <u>UNKNOWN</u> (gpd)	08 SOLE SOURCE AQUIFER <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

09 DESCRIPTION OF WELLS (including usage, depth, and location relative to population and buildings)

See section 5.2 Narrative.  
See Appendix E.

10 RECHARGE AREA	11 DISCHARGE AREA
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO COMMENTS Assumed due to net precipitation	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO COMMENTS Mill Creek is adjacent to site and may receive groundwater recharge

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION, DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☒ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
<u>Mill Creek</u>	<input checked="" type="checkbox"/>	<u>adjacent.</u> (mi)
	<input type="checkbox"/>	(mi)
	<input type="checkbox"/>	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN			02 DISTANCE TO NEAREST POPULATION
ONE (1) MILE OF SITE A. <u>12,114</u> NO. OF PERSONS	TWO (2) MILES OF SITE B. <u>33,696</u> NO. OF PERSONS	THREE (3) MILES OF SITE C. <u>71,096</u> NO. OF PERSONS	<u>on-site</u> (mi)
03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE <u>12,715</u>			04 DISTANCE TO NEAREST OFF-SITE BUILDING <u>~50</u> ft

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The Carstab site is located approximately three miles North of the northernmost boundary of the city of Cincinnati. Reading (the city where Carstab is located in) is a suburb of Cincinnati. The site is in an industrial zone that is surrounded by densely populated urban areas. Also see Sections 2.2 and 2.3 narratives.



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

IDENTIFICATION  
01 STATE 02 SITE NUMBER  
OH D 000 724 138

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A.  $10^{-9}$  -  $10^{-8}$  cm/sec ☒ B.  $10^{-4}$  -  $10^{-8}$  cm/sec ☐ C.  $10^{-4}$  -  $10^{-3}$  cm/sec ☐ D. GREATER THAN  $10^{-3}$  cm/sec.

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than  $10^{-8}$  cm/sec) ☐ B. RELATIVELY IMPERMEABLE ( $10^{-4}$  -  $10^{-8}$  cm/sec) ☒ C. RELATIVELY PERMEABLE ( $10^{-2}$  -  $10^{-4}$  cm/sec) ☐ D. VERY PERMEABLE (Greater than  $10^{-2}$  cm/sec)

03 DEPTH TO BEDROCK

~200 (m)

04 DEPTH OF CONTAMINATED SOIL ZONE

Unknown (m)

05 SOIL pH

unknown

06 NET PRECIPITATION

40 (in)

07 ONE YEAR 24 HOUR RAINFALL

2.5 (in)

08 SLOPE

SITE SLOPE

~2 %

DIRECTION OF SITE SLOPE

West

TERRAIN AVERAGE SLOPE

~2 %

09 FLOOD POTENTIAL

SITE IS IN >500 YEAR FLOODPLAIN

10  
N/A

☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE

OTHER

A. N.A. (m)

B. >2 (m)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

>2 (m)

ENDANGERED SPECIES: —

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL

RESIDENTIAL AREAS; NATIONAL/STATE PARKS,  
FORESTS, OR WILDLIFE RESERVES

AGRICULTURAL LANDS  
PRIME AG LAND AG LAND

A. Adjacent (m)

B. Adjacent (m)

C. 73 (m)

D. 73 (m)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

See 4-mile radius map (Appendix A).

VII. SOURCES OF INFORMATION (See specific references, e.g., state files, sample analysis, reports)

E&E Chicago  
file information



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE OH 02 SITE NUMBER 0 000 724 138

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	five	See section 3-4 narrative, Ground-	on file
SURFACE WATER		water samples were analyzed for TCL	
WASTE		compounds by Gulf South Environmental	
AIR		Laboratories, Inc. of New Orleans, Louisiana	
RUNOFF		and for TAL analytes by York Laboratories	
SPILL		Inc. of Monroe, Connecticut.	
SOIL	six	See section 3-4 narrative. Soil/	on file
VEGETATION		Sediment samples were analyzed for TCL	
OTHER = Sediment	one	compounds by Gulf South Environmental Laboratories, Inc. of New Orleans, Louisiana and for TAL	
		analytes by Silver Valley of Kellogg, Idaho.	

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
OVA 128	No readings above background in breathing zone
Radiation Monitor	No readings above background obtained
Explosimeter	No readings above background obtained
O <sub>2</sub> Meter	No readings deviated from background
Drager Tubes (HCN)	No readings above background obtained

IV. PHOTOGRAPHS AND MAPS

01 TYPE <input checked="" type="checkbox"/> GROUND <input type="checkbox"/> AERIAL	02 IN CUSTODY OF Ecology and Environment, Inc. / Chicago <small>(Name of organization or individual)</small>
03 MAPS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	04 LOCATION OF MAPS Ecology and Environment, Inc. / Chicago

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

pH and temperature were measured on the monitoring well samples. See Table 4-2 for results.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E&E Chicago  
file information



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

C1 STATE C2 SITE NUMBER  
OH 0 000 724 138

III. CURRENT OWNER(S)				PARENT COMPANY (if applicable)			
01 NAME Morton International		02 D+B NUMBER		06 NAME UNKNOWN		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 2000 West Street		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY Reading		06 STATE OH	07 ZIP CODE 45215	12 CITY		13 STATE	14 ZIP CODE
01 NAME N.A.		02 D+B NUMBER		06 NAME N.A.		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
01 NAME N.A.		02 D+B NUMBER		06 NAME N.A.		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
01 NAME N.A.		02 D+B NUMBER		06 NAME N.A.		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
III. PREVIOUS OWNER(S) (list most recent first)				IV. REALTY OWNER(S) (if applicable; list most recent first)			
01 NAME Morton Thiokol, Inc.		02 D+B NUMBER		01 NAME N.A.		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) Unknown		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	05 CITY		06 STATE	07 ZIP CODE
01 NAME Thiokol Corporation		02 D+B NUMBER		01 NAME N.A.		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) Unknown		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	05 CITY		06 STATE	07 ZIP CODE
01 NAME Cincinnati Milling Machine Co.		02 D+B NUMBER		01 NAME N.A.		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) Unknown		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	05 CITY		06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (list specific references, e.g., state files, sample analysis, reports)

E&E Chicago  
File Information



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 8 - OPERATOR INFORMATION

I IDENTIFICATION  
01 STATE 02 SITE NUMBER  
OH 000 724 138

II. CURRENT OPERATOR (Provide if different from owner)

OPERATOR'S PARENT COMPANY (if applicable)

01 NAME Carstab Corporation			02 D+B NUMBER			10 NAME Morton International			11 D+B NUMBER								
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 2000 West Street			04 SIC CODE			12 STREET ADDRESS (P.O. Box, RFD #, etc.) Unknown			13 SIC CODE								
05 CITY Reading			06 STATE OH			07 ZIP CODE 45215			14 CITY			15 STATE			16 ZIP CODE		
08 YEARS OF OPERATION 1989 - Present			09 NAME OF OWNER Morton International														

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)

01 NAME Carstab Corporation			02 D+B NUMBER			10 NAME Morton Thiokol, Inc.			11 D+B NUMBER								
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 2000 West Street			04 SIC CODE			12 STREET ADDRESS (P.O. Box, RFD #, etc.) Unknown			13 SIC CODE								
05 CITY Reading			06 STATE OH			07 ZIP CODE 45215			14 CITY			15 STATE			16 ZIP CODE		
08 YEARS OF OPERATION			09 NAME OF OWNER DURING THIS PERIOD														

01 NAME			02 D+B NUMBER			10 NAME Thiokol, Inc.			11 D+B NUMBER								
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 2000 West Street			04 SIC CODE			12 STREET ADDRESS (P.O. Box, RFD #, etc.) Unknown			13 SIC CODE								
05 CITY Reading			06 STATE OH			07 ZIP CODE 45215			14 CITY			15 STATE			16 ZIP CODE		
08 YEARS OF OPERATION			09 NAME OF OWNER DURING THIS PERIOD														

01 NAME Cincinnati Milling Machine, Co.			02 D+B NUMBER			10 NAME Unknown			11 D+B NUMBER								
03 STREET ADDRESS (P.O. Box, RFD #, etc.) UNKNOWN			04 SIC CODE			12 STREET ADDRESS (P.O. Box, RFD #, etc.)			13 SIC CODE								
05 CITY			06 STATE			07 ZIP CODE			14 CITY			15 STATE			16 ZIP CODE		
08 YEARS OF OPERATION			09 NAME OF OWNER DURING THIS PERIOD														

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E&E Chicago  
File Information



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER  
OH 0 000 724 138

II. ON-SITE GENERATOR

01 NAME Carstab Corporation	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 2000 West Street	04 SIC CODE	
05 CITY Reading	06 STATE OH	07 ZIP CODE 45215

III. OFF-SITE GENERATOR(S)

01 NAME UNKNOWN	02 D+B NUMBER	01 NAME UNKNOWN	02 D+B NUMBER		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME UNKNOWN	02 D+B NUMBER	01 NAME UNKNOWN	02 D+B NUMBER		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME UNKNOWN	02 D+B NUMBER	01 NAME UNKNOWN	02 D+B NUMBER		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME UNKNOWN	02 D+B NUMBER	01 NAME UNKNOWN	02 D+B NUMBER		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E&E Chicago  
File Information



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 10 - PAST RESPONSE ACTIVITIES

I IDENTIFICATION

01 STATE 02 SITE NUMBER  
OH 0 000 724 138

PAST RESPONSE ACTIVITIES

01 ☒ A. WATER SUPPLY CLOSED  
04 DESCRIPTION

02 DATE 05/15/89

03 AGENCY Ohio EPA

Attribution is unknown. See section 2.3 narrative.

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☐ D. SPILLED MATERIAL REMOVED  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☒ E. CONTAMINATED SOIL REMOVED

02 DATE 1980

03 AGENCY Owner

04 DESCRIPTION Six hazardous waste disposal pits were dredged and backfilled. Quality, quantity, and location of dredged materials unknown. Transportation manifests not on file.

01 ☐ F. WASTE REPACKAGED  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☒ G. WASTE DISPOSED ELSEWHERE

02 DATE present

03 AGENCY Owner

04 DESCRIPTION Approximately 150,000 to 170,000 pounds of hazardous wastes produced per year. Approximately half of these wastes are discharged into the air and sewer. The remaining half are solid wastes disposed off off-site, location unknown, no transportation manifests on file.

01 ☒ H. ON SITE BURIAL

02 DATE before 1980

03 AGENCY Owner

04 DESCRIPTION The owner allegedly buried an unknown number of steel and fibre drums on-site. These drums allegedly contain hazardous wastes.

01 ☒ I. IN SITU CHEMICAL TREATMENT

02 DATE 1950's to 1980

03 AGENCY Owner

04 DESCRIPTION Owner had six treatment/disposal pits (approximately 5 to 7 feet deep and unknown dimensions) where acids, organic compounds, and oils of unknown quantity were treated, stored, and/or disposed.

01 ☐ J. IN SITU BIOLOGICAL TREATMENT  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☐ K. IN SITU PHYSICAL TREATMENT  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☐ L. ENCAPSULATION  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☐ M. EMERGENCY WASTE TREATMENT  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☒ N. CUTOFF WALLS

02 DATE 12/1/1982

03 AGENCY Ohio EPA/Owner

04 DESCRIPTION After a legal battle between OEPA and owner, the owner installed a slurry wall and French drain to prevent any contaminants from entering Mill Creek. Also see Part II.

01 ☐ O. EMERGENCY DRAIN/SURFACE WATER DIVERSION  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☐ P. CUTOFF TRENCHES/SUMP  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown

01 ☐ Q. SUBSURFACE CUTOFF WALL  
04 DESCRIPTION

02 DATE

03 AGENCY

Unknown



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE 02 SITE NUMBER  
OH 0000724138

II. PAST RESPONSE ACTIVITIES *past*

01 ☐ R. BARRIER WALLS CONSTRUCTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ S. CAPPING/COVERING  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ T. BULK TANKAGE REPAIRED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ U. GROUT CURTAIN CONSTRUCTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ V. BOTTOM SEALED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ W. GAS CONTROL  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ X. FIRE CONTROL  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ Y. LEACHATE TREATMENT  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ Z. AREA EVACUATED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ 1. ACCESS TO SITE RESTRICTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ 2. POPULATION RELOCATED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

01 ☐ 3. OTHER REMEDIAL ACTIVITIES  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

*unknown*

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

E & E. Chicago  
File Information





POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
OH	0 000 724 138

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☒ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

Ohio EPA filed a Director's Findings and Orders (F&Os) against Carstab on 12/1/1982. to perform investigatory and remedial work. Carstab appealed these ordered and had them revoked. A second set of F&O's were issued by 01/15/1983. Since then Carstab has been cooperating with DEPA. Carstab did contract out for some investigatory and remedial work, resulting in the installation of a slurry wall and french drain. The dates of the investigatory/remedial work and who performed <sup>on</sup> it (i.e., contractors) remains unknown to FIT.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E.C.E Chicago  
File Information

APPENDIX F

FIT SITE PHOTOGRAPHS

## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.PAGE 1 OF 21U.S. EPA ID: OH0000724138TDD: F05-9008-013PAN: F0H0022SADATE: 10/1/90TIME: 14:00DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):S-1DESCRIPTION: A close-up photo of Soil Sample location  
S-1.DATE: 10/1/90TIME: 14:00DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):S-1DESCRIPTION: A perspective photo of Soil Sample location  
S-1



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.PAGE 2 OF 21U.S. EPA ID: OHD000724138TDD: F05-9008-013PAN: FOH0022SADATE: 10/1/90TIME: 16:40DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):S-2DESCRIPTION: A close up photo of Soil Sample location  
S-2DATE: 10/1/90TIME: 16:40DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):S-2DESCRIPTION: A perspective photo of soil Sample location  
S-2



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.PAGE 3 OF 21U.S. EPA ID: OH000724138TDD: F05-9008-013PAN: F0H0022SADATE: 10/2/90TIME: 10:00DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  76°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A close-up photo of soil sample location  
S-2, the hole FIT dug was back-filled with bentonite.DATE: 10/2/90TIME: 10:00DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  76°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A photo of sealed drum containing  
soil from deep soil samples S1 and S2 drilling.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.PAGE 4 OF 21U.S. EPA ID: OHD000724138TDD: F05-9008-013PAN: F0H0022SADATE: 10/1/90TIME: 1700DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):S-3DESCRIPTION: A close-up photo of Sediment Sample location  
S-3DATE: 10/1/90TIME: 1700DIRECTION OF  
PHOTOGRAPH:WestWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):S-3DESCRIPTION: A perspective photo of Sediment Sample location  
S-3



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 5 OF 21

U.S. EPA ID: OHD000724138TOD: F05-9008-013PAN: F0H0022SADATE: 10/1/90TIME: 1730DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):S-4DESCRIPTION: A close-up photo of soil sample location S-4.DATE: 10/1/90TIME: 1730DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):S-4DESCRIPTION: A perspective photo of soil sample location S-4.



FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 6 OF 21

U.S. EPA ID: OHD000724138

TDD: F05-9008-013

PAN: FOH00225A

DATE: 10/1/90

TIME: 1750

DIRECTION OF  
PHOTOGRAPH:

North

WEATHER  
CONDITIONS:

Clear

Temp = 70°f

PHOTOGRAPHED BY:

Cortney Schmidt

SAMPLE ID  
(if applicable):

S-5



DESCRIPTION: A close-up photo of soil sample location S-5.

DATE: 10/1/90

TIME: 1750

DIRECTION OF  
PHOTOGRAPH:

North

WEATHER  
CONDITIONS:

Clear

Temp = 70°f

PHOTOGRAPHED BY:

Cortney Schmidt

SAMPLE ID  
(if applicable):

S-5



DESCRIPTION: A perspective photo of soil sample location S-5.



FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 7 OF 21

U.S. EPA ID: OH000724138

TDD: F05-9008-013

PAN: FOH00225A

DATE: 10/1/90

TIME: 18:10

DIRECTION OF  
PHOTOGRAPH:

East

WEATHER  
CONDITIONS:

Clear

Temp ~ 70°F

PHOTOGRAPHED BY:

Cortney Schmidt

SAMPLE ID  
(if applicable):

S-6



DESCRIPTION: A close-up photo of Soil Sample location S-6.

DATE: 10/1/90

TIME: 18:10

DIRECTION OF  
PHOTOGRAPH:

East

WEATHER  
CONDITIONS:

Clear

Temp ~ 70°F

PHOTOGRAPHED BY:

Cortney Schmidt

SAMPLE ID  
(if applicable):

S-6



DESCRIPTION: A perspective photo of Soil Sample location S-6



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.PAGE 8 OF 21U.S. EPA ID: OH D000724138, TOD: F05-9008-013PAN: F0H0022SADATE: 10/1/90TIME: 18:30DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  70°f

PHOTOGRAPHED BY:

Nathan RussellSAMPLE ID  
(if applicable):S-7DESCRIPTION: A close-up photo of soil sample location S-7.DATE: 10/1/90TIME: 18:30DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  70°f

PHOTOGRAPHED BY:

Nathan RussellSAMPLE ID  
(if applicable):S-7DESCRIPTION: A perspective photo of soil sample location S-7



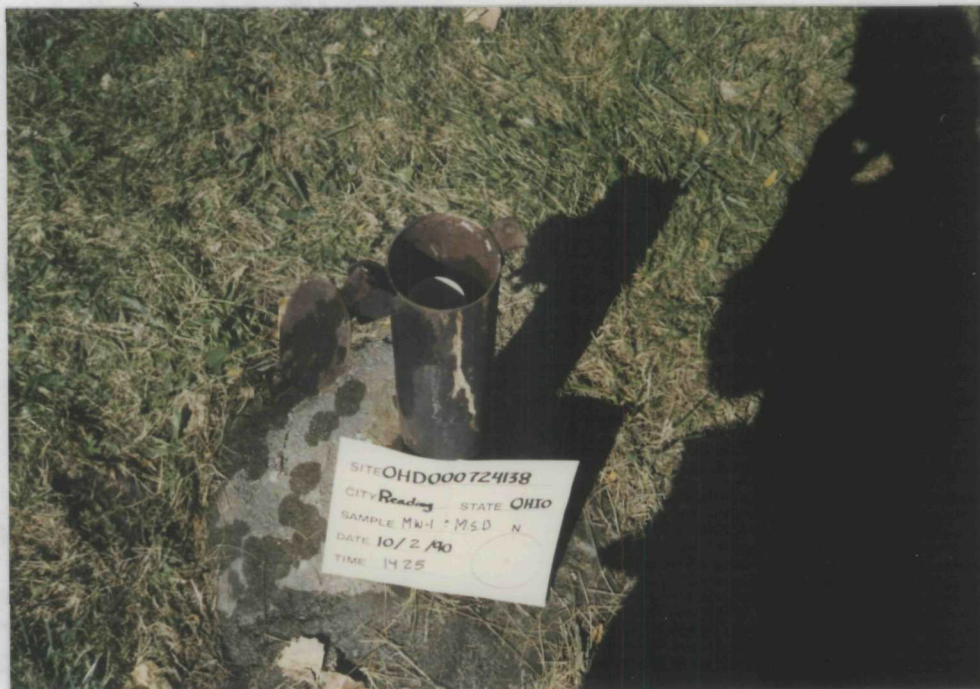
## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 9 OF 21

U.S. EPA ID: OHD000724138TOD: F05-9008-013PAN: F0H00225ADATE: 10/2/90TIME: 14:25DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  76°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):MW-1  $\div$  M.S.D.DESCRIPTION: A close-up photo of monitoring well sample  
location MW-1  $\div$  M.S.D.DATE: 10/2/90TIME: 14:25DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  76°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):M.W-1  $\div$  M.S.DDESCRIPTION: A perspective photo of monitoring well sample  
location M.W-1  $\div$  M.S.D.



FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 10 OF 21

U.S. EPA ID: OHD000724138

TDD: F05-9008-013

PAN: F0H0022SA

DATE: 10/2/90

TIME: 15:30

DIRECTION OF  
PHOTOGRAPH:

North

WEATHER  
CONDITIONS:

Clear,

Temp  $\approx$  76°F

PHOTOGRAPHED BY:

Cortney Schmidt

SAMPLE ID  
(if applicable):

M.W. - 2 : Dup.



DESCRIPTION: A close-up photo of monitoring well sample location

M.W. - 2 and Duplicate.

DATE: 10/2/90

TIME: 15:30

DIRECTION OF  
PHOTOGRAPH:

North

WEATHER  
CONDITIONS:

Clear,

Temp  $\approx$  76°F

PHOTOGRAPHED BY:

Cortney Schmidt

SAMPLE ID  
(if applicable):

M.W. - 2 : Dup



DESCRIPTION: A perspective photo of monitoring well sample location

M.W. - 2 : Duplicate.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 11 OF 21

U.S. EPA ID: OHD000724138TOD: F05-9008-013PAN: F0H0022SADATE: 10/2/90TIME: 15:15DIRECTION OF  
PHOTOGRAPH:North EastWEATHER  
CONDITIONS:Clear,Temp  $\approx$  76°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):MW-3DESCRIPTION: A Close-up photo of monitoring well Sample location  
MW-3.DATE: 10/2/90TIME: 15:15DIRECTION OF  
PHOTOGRAPH:North EastWEATHER  
CONDITIONS:Clear,Temp  $\approx$  76°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):MW-3DESCRIPTION: A perspective photo of Sample location of Monitoring  
Well - M.W.-3.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 12 OF 21

U.S. EPA ID: OHDO00724138TOD: F05-9008-013PAN: FOH0022SADATE: 10/2/90TIME: 14:15DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  76°F

PHOTOGRAPHED BY:

Cortney Schmidt

SAMPLE ID

(if applicable):

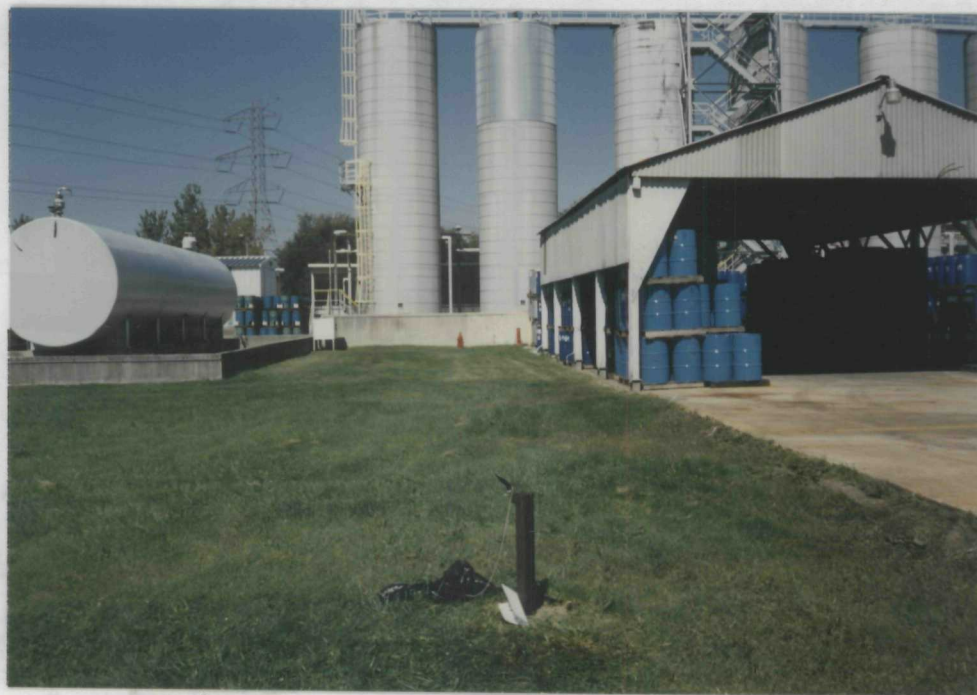
MW-4DESCRIPTION: A close-up photo of Monitoring Well Sample location  
MW-4DATE: 10/2/90TIME: 14:15DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  76°F

PHOTOGRAPHED BY:

Cortney Schmidt

SAMPLE ID

(if applicable):

MW-4DESCRIPTION: A perspective photo of monitoring Well Sample  
location MW-4



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.PAGE 13 OF 21U.S. EPA ID: OHD000724138TOD: F05-9008-013PAN: F0H0022SADATE: 10/2/90TIME: 16:30DIRECTION OF  
PHOTOGRAPH:North WestWEATHER  
CONDITIONS:Clear,Temp  $\approx$  76°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):MW-5DESCRIPTION: A close-up photo of sample location for monitoring  
Well - M.W-5.DATE: 10/2/90TIME: 16:30DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  76°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):MW-5DESCRIPTION: A perspective photo of monitoring well sample  
location M.W-5.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 14 OF 21

U.S. EPA ID: OHD000724138TDD: F05-9008-013PAN: F0H0022SADATE: 10/1/90TIME: 12:50DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  70°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A dried leachate seep, note the  
water in the lower left corner is mill creek.DATE: 10/1/90TIME: 12:50DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Clear,Temp  $\approx$  70°f

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: Another photo of the dried leachate  
seep.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 15 OF 21

U.S. EPA ID: OHD000724138TDD: F05-9008-013PAN: F0H0022SADATE: 10/1/90TIME: 12:05DIRECTION OF  
PHOTOGRAPH:South eastWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A close up photo of Laboratory Solvents.DATE: 10/1/90TIME: 12:05DIRECTION OF  
PHOTOGRAPH:South eastWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A perspective photo of the Lab. Solvents.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 16 OF 21

U.S. EPA ID: OHD000724138TDD: F05-9008-013PAN: F0H0022SADATE: 10/1/90TIME: 11:48DIRECTION OF  
PHOTOGRAPH:SouthWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A close-up photo of a drum in the  
hazardous waste storage areaDATE: 10/1/90TIME: 11:48DIRECTION OF  
PHOTOGRAPH:South WestWEATHER  
CONDITIONS:ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A close-up photo of xylene in drums  
stored in the Hazardous Waste Storage area.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 17 OF 21

U.S. EPA ID: OHD000724138TDD: F05-9008-013PAN: F0H00225ADATE: 10/1/90TIME: 11:55DIRECTION OF  
PHOTOGRAPH:WestWEATHER  
CONDITIONS:ClearTemp  $\approx$  70 $^{\circ}$ F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A photo of the Hazardous Waste Storage  
area drainage system.DATE: 10/1/90TIME: 11:55DIRECTION OF  
PHOTOGRAPH:WestWEATHER  
CONDITIONS:ClearTemp  $\approx$  70 $^{\circ}$ F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A close-up photo of the Hazard  
Waste Storage area drain.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.PAGE 18 OF 21U.S. EPA ID: OHD000724138TDD: F05-9008-013PAN: FOH00225ADATE: 10/1/90TIME: 11:35DIRECTION OF  
PHOTOGRAPH:EastWEATHER  
CONDITIONS:Temp.  $\approx$  70°FClear Sky

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/A.DESCRIPTION: Storage Tanks for feedstocks.DATE: 10/1/90TIME: 11:37DIRECTION OF  
PHOTOGRAPH:WestWEATHER  
CONDITIONS:Temp  $\approx$  70°FClear Sky

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: Carbo-Alkor powder being stored on  
pallets. This storage area is located on the Northwestern  
of the site.



## FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 19 OF 21

U.S. EPA ID: OHD000724138TOD: F05-9008-013PAN: F0H0022SADATE: 10/1/90TIME: 11:40DIRECTION OF  
PHOTOGRAPH:NorthWEATHER  
CONDITIONS:Sky's ClearTemp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: A photo of drums stored on the property  
to the north of the Carstab site.DATE: 10/1/90TIME: 11:57DIRECTION OF  
PHOTOGRAPH:North westWEATHER  
CONDITIONS:Clear,Temp  $\approx$  70°F

PHOTOGRAPHED BY:

Cortney SchmidtSAMPLE ID  
(if applicable):N/ADESCRIPTION: Another photo of the property north of Carstab  
This photo was taken east of the photo above.



FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 20 OF 21

U.S. EPA ID: OHD000724138

TDD: F05-9008-013

PAN: FOH0022SA



DATE: 10/1/90 TIME: 11:42 DIRECTION OF PHOTOGRAPH: South PHOTOGRAPHED BY: Cortney Schmidt

WEATHER CONDITIONS: Clear, Temp  $\approx$  70°F SAMPLE ID (if applicable): N/A

DESCRIPTION: Photo of the Hazardous Waste Storage area, This photo was  
taken from the north on-site road.



FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: Carstab Corp.

PAGE 21 OF 21

U.S. EPA ID: OHD000724138

TDD: F05-9008-013

PAN: FOH0022SA



DATE: 10/1/90 TIME: 11:44 DIRECTION OF PHOTOGRAPH: South PHOTOGRAPHED BY: Cortney Schmidt

WEATHER CONDITIONS: Clear, Temp  $\approx$  70°F SAMPLE ID (if applicable): N/A

DESCRIPTION: A closer photo the drums stored in the hazardous waste storage area.

APPENDIX G

U.S. EPA TARGET COMPOUND LIST AND  
TARGET ANALYTE LIST  
QUANTITATION/DETECTION LIMITS



**ADDENDUM A**

**ROUTINE ANALYTICAL SERVICES  
CONTRACT REQUIRED DETECTION AND QUANTITATION LIMITS**

Contract Laboratory Program  
Target Compound List  
Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Chloromethane	74-87-3	10 ug/L	10 ug/Kg
Bromomethane	74-83-9	10	10
Vinyl chloride	75-01-4	10	10
Chloroethane	75-00-3	10	10
Methylene chloride	75-09-2	5	5
Acetone	67-64-1	10	5
Carbon disulfide	75-15-0	5	5
1,1-dichloroethene	75-35-4	5	5
1,1-dichloroethane	75-34-3	5	5
1,2-dichloroethene (total)	540-59-0	5	5
Chloroform	67-66-3	5	5
1,2-dichloroethane	107-06-2	5	5
2-butanone (MEK)	78-93-3	10	10
1,1,1-trichloroethane	71-55-6	5	5
Carbon tetrachloride	56-23-5	5	5
Vinyl acetate	108-05-4	10	10
Bromodichloromethane	75-27-4	5	5
1,2-dichloropropane	78-87-5	5	5
cis-1,3-dichloropropene	10061-01-5	5	5
Trichloroethene	79-01-6	5	5
Dibromochloromethane	124-48-1	5	5
1,1,2-trichloroethane	79-00-5	5	5
Benzene	71-43-2	5	5
Trans-1,3-dichloropropene	10061-02-6	5	5
Bromoform	75-25-2	5	5
4-Methyl-2-pentanone	108-10-1	10	10
2-Hexanone	591-78-6	10	10
Tetrachloroethene	127-18-4	5	5
Toluene	108-88-3	5	5
1,1,2,2-tetrachloroethane	79-34-5	5	5
Chlorobenzene	108-90-7	5	5
Ethyl benzene	100-41-4	5	5
Styrene	100-42-5	5	5
Xylenes (total)	1330-20-7	5	5

Table A  
Contract Laboratory Program  
Target Compound List  
Semivolatiles Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Phenol	108-95-2	10 ug/L	330 ug/Kg
bis(2-Chloroethyl) ether	111-44-4	10	330
2-Chlorophenol	95-57-8	10	330
1,3-Dichlorobenzene	541-73-1	10	330
1,4-Dichlorobenzene	106-46-7	10	330
Benzyl Alcohol	100-51-6	10	330
1,2-Dichlorobenzene	95-50-1	10	330
2-Methylphenol	95-48-7	10	330
bis(2-Chloroisopropyl) ether	108-60-1	10	330
4-Methylphenol	106-44-5	10	330
N-Nitroso-di-n-dipropylamine	621-64-7	10	330
Hexachloroethane	67-72-1	10	330
Nitrobenzene	98-95-3	10	330
Isophorone	78-59-1	10	330
2-Nitrophenol	88-75-5	10	330
2,4-Dimethylphenol	105-67-9	10	330
Benzoic Acid	65-85-0	50	1600
bis(2-Chloroethoxy) methane	111-91-1	10	330
2,4-Dichlorophenol	120-83-2	10	330
1,2,4-Trichlorobenzene	120-82-1	10	330
Naphthalene	91-20-3	10	330
4-Chloroaniline	106-47-8	10	330
Hexachlorobutadiene	87-68-3	10	300
4-Chloro-3-methylphenol	59-50-7	10	330
2-Methylnaphthalene	91-57-6	10	330
Hexachlorocyclopentadiene	77-47-4	10	330
2,4,6-Trichlorophenol	88-06-2	10	330
2,4,5-Trichlorophenol	95-95-4	50	1600
2-Chloronaphthalene	91-58-7	10	330
2-Nitroaniline	88-74-4	50	1600
Dimethylphthalate	131-11-3	10	330
Acenaphthylene	208-96-8	10	330
2,6-Dinitrotoluene	606-20-2	10	330
3-Nitroaniline	99-09-2	50	1600
Acenaphthene	83-32-9	10	330
2,4-Dinitrophenol	51-28-5	50	1600
4-Nitrophenol	100-02-7	50	1600
Dibenzofuran	132-64-9	10	330
2,4-Dinitrotoluene	121-14-2	10	330
Diethylphthalate	84-66-2	10	330
4-Chlorophenyl-phenyl ether	7005-72-3	10	330

Table A  
Contract Laboratory Program  
Target Compound List  
Semivolatiles Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SLUDGE SEDIMENT
Fluorene	86-73-7	10 ug/L	330 ug/Kg
4-Nitroaniline	100-01-6	50	1600
4,6-Dinitro-2-methylphenol	534-52-1	50	1600
N-nitrosodiphenylamine	86-30-6	10	330
4-Bromophenyl-phenylether	101-55-3	10	330
Hexachlorobenzene	118-74-1	10	330
Pentachlorophenol	87-86-5	50	1600
Phenanthrene	85-01-8	10	330
Anthracene	120-12-7	10	330
Di-n-butylphthalate	84-74-2	10	330
Fluoranthene	206-44-0	10	330
Pyrene	129-00-0	10	330
Butylbenzylphthalate	85-68-7	10	330
3,3'-Dichlorobenzidine	91-94-1	20	660
Benzo(a)anthracene	56-55-3	10	330
Chrysene	218-01-9	10	330
bis(2-Ethylhexyl)phthalate	117-81-7	10	330
Di-n-octylphthalate	117-84-0	10	330
Benzo(b)fluoranthene	205-99-2	10	330
Benzo(k)fluoranthene	207-08-9	10	330
Benzo(a)pyrene	50-32-8	10	330
Indeno(1,2,3-cd)pyrene	193-39-5	10	330
Dibenz(a,h)anthracene	53-70-3	10	330
Benzo(g,h,i)perylene	191-24-2	10	330

Table A  
Contract Laboratory Program  
Target Compound List  
Pesticide and PCB Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
alpha-BHC	319-84-6	0.05 ug/L	8 ug/Kg
beta-BHC	319-85-7	0.05	8
delta-BHC	319-86-8	0.05	8
gamma-BHC (Lindane)	58-89-9	0.05	8
Heptachlor	76-44-8	0.05	8
Aldrin	309-00-2	0.05	8
Heptachlor epoxide	1024-57-3	0.05	8
Endosulfan I	959-98-8	0.05	8
Dieldrin	60-57-1	0.10	16
4,4'-DDE	72-55-9	0.10	16
Endrin	72-20-8	0.10	16
Endosulfan II	33213-65-9	0.10	16
4,4'-DDD	72-54-8	0.10	16
Endosulfan sulfate	1031-07-8	0.10	16
4,4'-DDT	50-29-3	0.10	16
Methoxychlor (Mariate)	72-43-5	0.5	80
Endrin ketone	53494-70-5	0.10	16
alpha-Chlordane	5103-71-9	0.5	80
gamma-chlordane	5103-74-2	0.5	80
Toxaphene	8001-35-2	1.0	160
AROCLOR-1016	12674-11-2	0.5	80
AROCLOR-1221	11104-28-2	0.5	80
AROCLOR-1232	11141-16-5	0.5	80
AROCLOR-1242	53469-21-9	0.5	80
AROCLOR-1248	12672-29-6	0.5	80
AROCLOR-1254	11097-69-1	1.0	160
AROCLOR-1260	11096-82-5	1.0	160

Table A (Cont.)

CONTRACT LABORATORY PROGRAM  
 TARGET ANALYTE LIST (TAL)  
 INORGANIC DETECTION LIMITS

Compound	Procedure	Detection Limits	
		Water (µg/L)	Soil Sediment Sludge (ng/kg)
aluminum	ICP	200	40
antimony	furnace	60	2.4
arsenic	furnace	10	2
barium	ICP	200	40
beryllium	ICP	5	1
cadmium	ICP	5	1
calcium	ICP	5,000	1,000
chromium	ICP	10	2
cobalt	ICP	50	10
copper	ICP	25	5
iron	ICP	100	20
lead	furnace	5	1
magnesium	ICP	5,000	1,000
manganese	ICP	15	3
mercury	cold vapor	0.2	0.008
nickel	ICP	40	8
potassium	ICP	5,000	1,000
selenium	furnace	5	1
silver	ICP	10	2
sodium	ICP	5,000	1,000
thallium	furnace	10	2
tin	ICP	40	8
vanadium	ICP	50	10
zinc	ICP	20	4
cyanide	color	10	2

3767:1

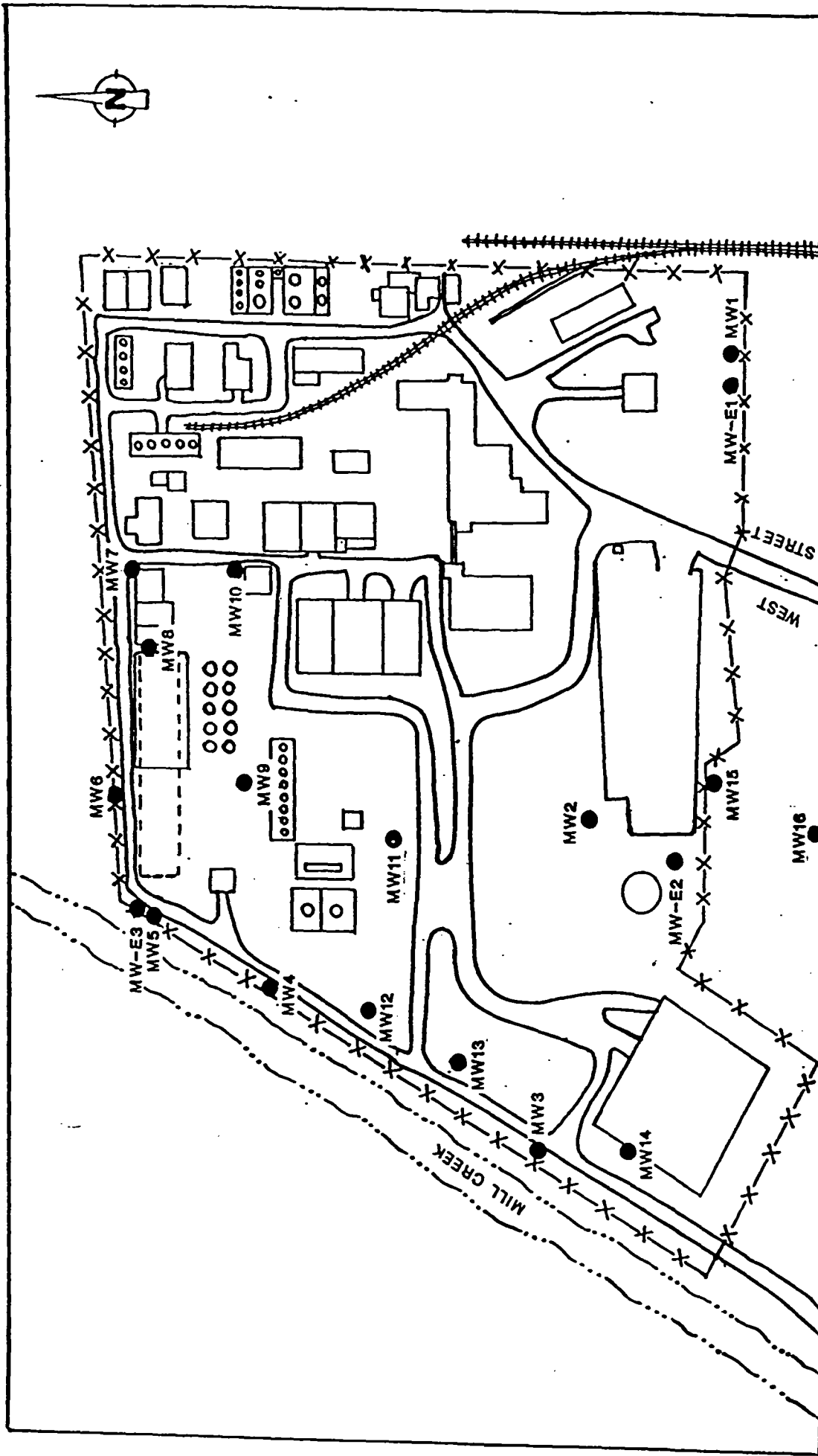
## APPENDIX H

### WELL LOGS OF THE AREA OF THE SITE

APPENDIX H

WELL LOGS OF THE AREA OF THE SITE





SCALE 0 125 250 375 500 FEET

LOCATION OF MONITORING WELLS

MW-1  
(Installed 12/9/80)

Depth (ft)	Blow Count	Description
0.0 - 1.5	2-2-4	Soil, dark brown, becomes tan and sandy toward bottom with an increased amount of clay
2.5 - 4.0	1-2-2	Clay, tan and sandy with decreasing amount of sand toward bottom; possible iron staining in very sandy zone
5.0 - 6.5	4-4-7	Clay, tan and sandy with some gravel present
7.5 - 9.0	6-12-21	Clay, tan with coarse sand and gravel; hit water table
10.0 - 11.5	7-10-14	Clay, tan grading to gray, some gravel present
12.5 - 14.0	8-13-14	Clay, tan grading to gray, some gravel present; gravel more abundant in top of sample
15.0 - 16.5	13-11-11	Clay, gray with some pebbles grading to medium, relatively clean sand
17.5 - 19.0	7-6-6	Sand and gravel, coarsening downward; 3-inch clay lens in middle of sample
19.0 - 20.5	5-5-5	Gravel and coarse sand; possibly some clay present

Construction: 10' of 1 1/2" blank over 10' of 1 1/2", .010 slot screen.  
Well set at 19 feet.

MW-2  
(Installed 12/9/80)

Depth (ft)	Blow Count	Description
0.0 - 1.5	8-5-7	Fill, brown and earthy with some limestone, gravel, and minor amounts of sand
2.5 - 4.0	6-5-4	Fill, reddish-brown with rock fragments, pebbles, and some sand
5.0 - 6.5	4-3-2	Fill, reddish-brown with some sand
7.5 - 9.0	3-3-5	Fill, reddish-brown with some sand
10.0 - 11.5	2-2-3	Fill becoming very sandy toward bottom; sand may be natural
12.5 - 14.0	9-9-11	Sand and gravel with a 1" clay lens at base; appear to hit water table at approximately 13.5 feet
15.0 - 16.5	9-13-34	Sand with some gravel changing abruptly to a black, chemical saturated sand and gravel
17.5 - 19.0	13-14-15	Gravel and coarse sand, black chemical saturated
19.0 - 20.5	10-21-23	Sand and gravel, black chemical saturated, changing abruptly to brown clay with some sand; brown clay is not chemical saturated

Construction: 10' of 1 1/2" blank over 10' of 1 1/2", .010 slot screen. Well set at 20 feet.

Geraghty &amp; Miller, Inc

MW-3  
(Installed 12/16/80)

Depth (ft)	Blow Count	Description
0.0 - 1.5	5-6-5	Silt and clay, dark brown with some gravel
2.5 - 4.0	3-3-3	Silt and clay, brown with some sand
5.0 - 6.5	3-5-5	Mixture of silt, clay, sand, and gravel, tan
7.5 - 9.0	4-15-16	Sand and gravel, tan with some silt
10.0 - 11.5	7-8-8	Sand, medium to coarse, tan with some gravel
12.5 - 14.0	8-12-15	Sand, medium to coarse, tan with some gravel; appear to hit water table at approximately 14 feet
15.0 - 16.5	5-8-12	Sand with some gravel, black chemical saturated throughout
17.5 - 19.0	8-8-9	Sand, black chemical saturated, changing to gray silty clay
19.0 - 20.5		Shelby tube

Construction: 10' of 1 1/2" blank over 10' of 1 1/2", .010 slot screen. Well  
set at 19.5 feet.

Geraghty &amp; Miller, Inc

MW-4  
(Installed 12/17/80)

Depth (ft)	Blow Count	Description
0.0 - 1.5	8-7-8	Clay, dark brown with some silt
2.5 - 4.0	4-2-3	Clay, brown with silt
5.0 - 6.5	3-3-4	Sand, tan, very silty with some clay
7.5 - 9.0	6-6-4	Sand, tan with silt and gravel; changes abruptly to a black chemical saturated sand
10.0 - 11.5	6-9-12	Sand and gravel, black chemical saturated; appear to hit water table at approximately 11 feet; sample to be analyzed by PEDCo
12.5 - 14.0	13-12-13	Gravel and sand changing to clay; entire sample is chemical saturated
15.0 - 16.5	6-11-15	Clay, gray, silty with some gravel; sample to be analyzed by PEDCo
17.0 - 18.5		Shelby tube

Construction: 10' of 1 1/2" blank over 8' of 1 1/2", .010 slot screen. Well set at 17 feet.

Geraghty &amp; Miller, Inc.

MW-5  
(Installed 12/17/80)

Depth (ft)	Blow Count	Description
0.0 - 1.5	5-4-8	Clay, brown with some sand and gravel
2.5 - 4.0	5-4-5	Clay and silt, brown
5.0 - 6.5	4-5-6	Sand, dark gray with some silt and gravel; most of sample appears to contain black chemical
7.5 - 9.0	5-7-7	Gravel, sand, and some clay, black chemical saturated; hit water table at approximately 8.5 feet
10.0 - 11.5	9-13-22	Gravel and sand, black chemical saturated; sample to be analyzed by Pedco
12.5 - 14.0	4-8-13	Clay, gray with a lot of silt and some gravel; minor amounts of black chemical present
14.0 - 16.0		Clay, brownish-gray with some gravel
16.0 - 18.0		Shelby tube

Construction: 7' of 1-1/2" blank over 10' of 1-1/2", .010 slot screen.  
Well set at 16 feet.

MW-6  
(Installed 12/17/80)

Depth (ft)	Blow Count	Description
0.0 - 0.5	5-4-8	Road asphalt
0.5 - 2.0		Road gravel
2.5 - 4.0	4-5-6	Clay and silt, dark greenish black
5.0 - 6.5	4-10-16	Sand, coarse with some silt; black chemical saturated
7.5 - 9.0	4-7-11	Sand, coarse, changing to sand and gravel; entire sample is black chemical saturated; hit water table at approximately 8.5 ft
10.0 - 11.5	5-3-3	Clay, gray with lot of silt and sand
12.0 - 12.5		Shelby tube
12.5 - 14.0	17-30-43	Sand and gravel, black chemical saturated
15.0 - 16.5	5-10-15	Sand and gravel changing to clay, dark gray with a lot of silt and some sand
17.5 - 19.0	6-11-17	Clay with silt, sand, and some gravel

Construction: 7' of 1-1/2" blank over 10' of 1-1/2", .010 slot screen.  
Well set at 17.5 feet.

MW-7  
(Installed 12/17/80)

Depth (ft)	Blow Count	Description
0.0 - 1.0		Road asphalt
1.0 - 2.5	9-6-5	Clay, dark green to black, changing to sand and gravel, brown
2.5 - 4.0	3-3-4	Silt and clay, green to brown with some sand
5.0 - 6.5	4-4-6	Clay and silt, dark greenish brown
7.5 - 9.0	5-7-7	Silt and clay, light brown with some sand
10.0 - 11.5	3-1-1	Silt and clay, light brown, changing to fine sand, gray; appear to have hit water table
12.5 - 14.0	7-10-10	Sand, light brown with some gravel
15.0 - 16.5	5-9-11	Clay and silt, dark green to brown with some gravel and sand
17.5 - 19.0	8-13-17	Clay and silt, dark green with some gravel
20.0 - 21.5	5-14-18	Clay and silt dark green, changing to sand and gravel, brown; sand and gravel was dry

Construction: 10' of 1 1/2" blank over 10' of 1 1/2", .010 slot screen. Well set at 20.5 feet.



MW-8  
(Installed 12/17/80)

Depth (ft)	Blow Count	Description
0.0 - 1.5	5-5-5	Fill consisting of clay, sand, and gravel, brown
2.5 - 4.0	4-3-5	Fill consisting of clay, silt, and gravel, brown, earthy texture
5.0 - 6.5	6-10-8	Fill consisting of gravel and some clay (poor recovery)
7.5 - 9.0	6-7-6	Fill consisting of silt and sand, reddish-brown
10.0 - 11.5	7-8-10	Fill consisting of sand and silt, reddish-brown; hit water table
12.5 - 14.0	11-9-13	Sand and silt, black chemical saturated
15.0 - 16.5	4-8-11	Clay, gray, some black chemical present
16.5 - 18.0	6-10-13	Clay, gray with some gravel

Construction: 7' of 1-1/2" blank over 10' of 1-1/2", .010 slot screen.  
Well set at 16 feet.

MW-9  
(Installed 12/18/80)

Depth (ft)	Blow Count	Description
2.5 - 4.0	5-4-6	Clay, brown with some silt, earthy texture
5.0 - 6.5	3-4-6	Clay, brown with some silt, becoming sandier toward bottom of sample
7.5 - 9.0	6-11-10	Sand and gravel, black chemical saturated; appear to hit water table
10.0 - 11.5	6-12-18	Sand and gravel, black chemical saturated
12.5 - 14.0	16-23-25	Gravel and sand with some silt, black chemical saturated
15.0 - 16.5	8-12-16	Clay, gray with silt
16.5 - 18.0	3-11-22	Clay, gray with silt and some gravel

Construction: 7' of 1 1/2" blank over 10' of 1 1/2", .010 slot screen. Well  
set at 16 feet.

Geraghty &amp; Miller, Inc.

MW-10  
(Installed 12/18/80)

Depth (ft)	Blow Count	Description
0.0 - 1.5	4-5-6	Clay, reddish-brown with some silt
2.5 - 4.0	3-2-3	Clay, brown with some silt
5.0 - 6.5	4-5-6	Clay, brown with a little silt
7.5 - 9.0	3-2-3	Silt and clay with some sand becoming black and siltier toward bottom; some black chemical present
10.0 - 11.5	5-5-6	Gravel and sand with some silt, black chemical saturated
12.5 - 14.0	5-8-10	Clay, grey with silt
14.0 - 16.5	5-9-13	Clay, grey with silt and some gravel

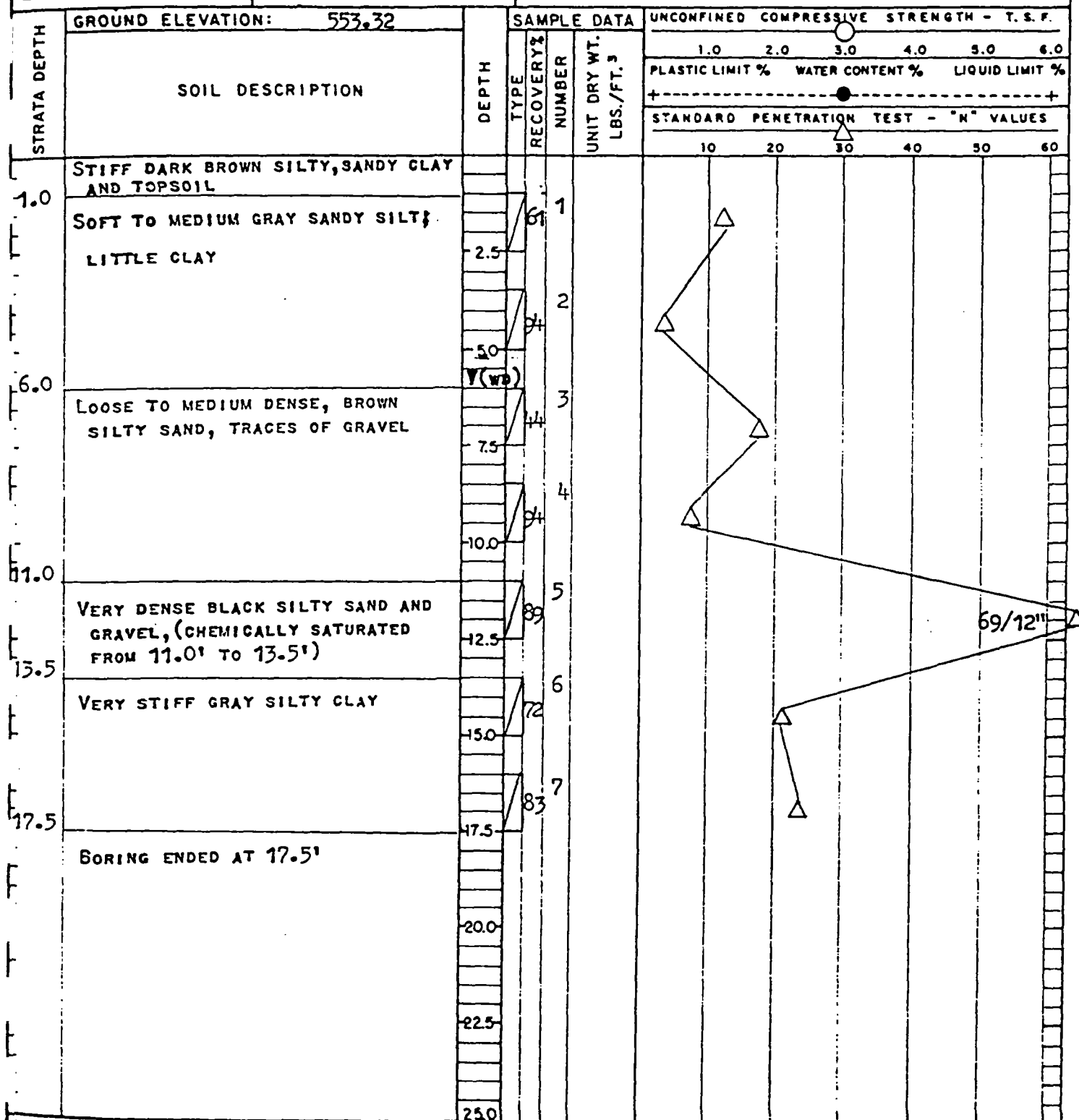
Construction: 5.5 of 1-1/2" blank over 10' of 1-1/2", .010 slot screen.  
Well set at 15 feet.

# SALISBURY ENGINEERING

1501 E. MAIN STREET, GRIFFITH, IND.

BORING NO. 1MW111

WATER LEVEL DATA		STARTED <u>7/12/83</u>	LOCATION <u>CARSTAB FACILITY</u>
<u>6.0</u> FT. W.D.		COMPLETED <u>SAME</u>	<u>GROUND WATER STUDY</u>
<u>7.9</u> FT. <u>7/20/83</u>		DRILLER <u>PM</u>	<u>CINCINNATI, OHIO</u>
____ FT. ____ HR. A.D.		HELPER _____	CLIENT <u>THIOLKOL/CARSTAB CORPORATION</u>
____ FT. ____ HR. A.D.		FILE NO. <u>6342</u>	<u>CINCINNATI, OHIO</u>



## NOTES:

## LEGEND:

- SPLIT SPOON, 
 - SHELBY TUBE, 
 - PISTON, 
 - AUGER, 
 - ROCK CORE, 
 - CALIBRATED PENETROMETER

W.D. - WHILE DRILLING, A.D. - AFTER DRILLING

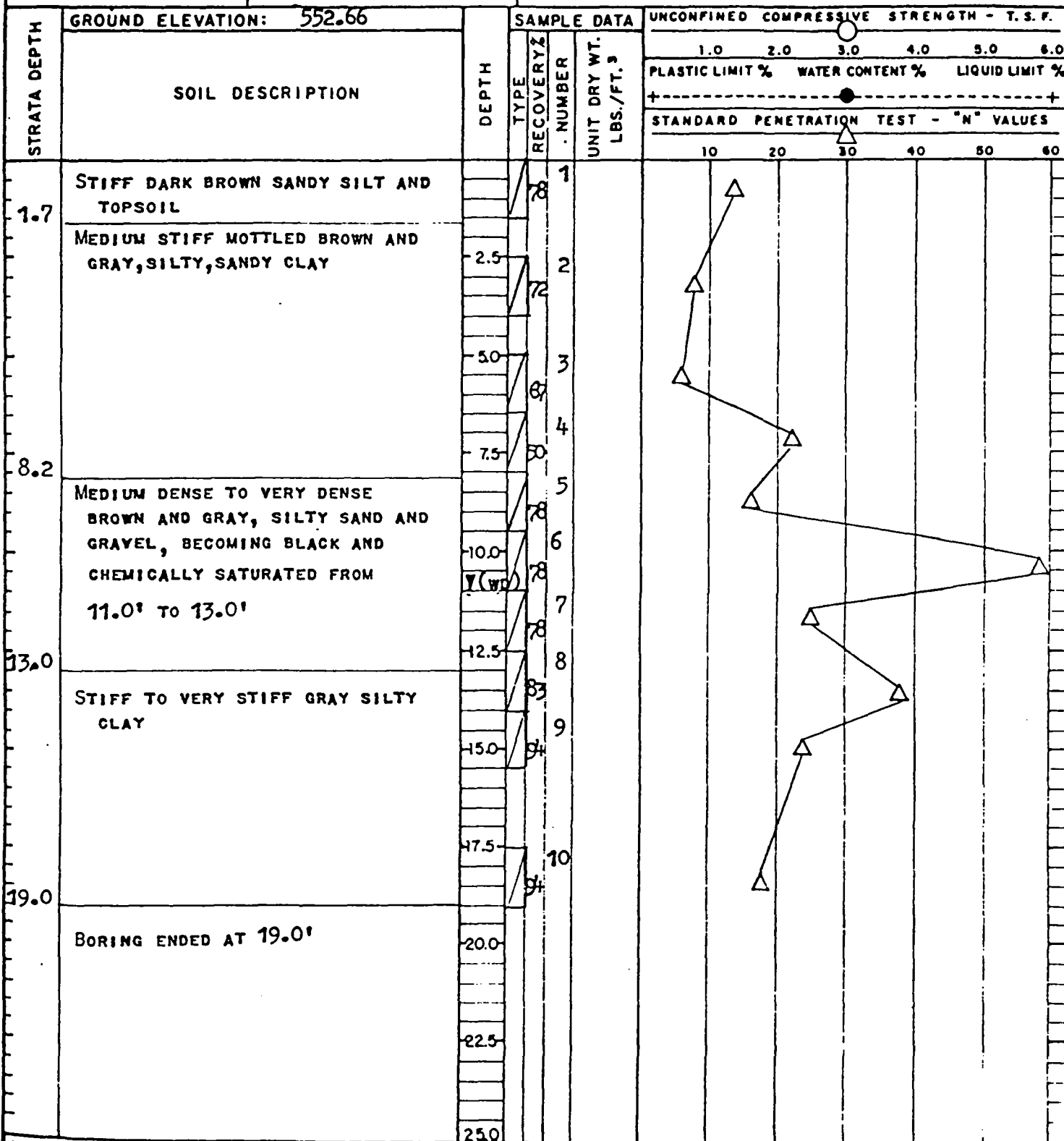
THE "N" VALUES IN THE STANDARD PENETRATION TEST ARE BLOWS PER FOOT REQUIRED TO DRIVE A 2" O.D. SPLIT SPOON SAMPLER USING A 140 POUND WEIGHT FALLING FREE FOR A DISTANCE OF 30".

**SALISBURY ENGINEERING**  
1501 E. MAIN STREET, GRIFFITH, IND.

BORING NO. AMW12

WATER LEVEL DATA  
10.5 FT. W.D.  
11.0 FT. 7/20/83  
 \_\_\_\_\_ FT. \_\_\_\_\_ HR. A.D.  
 \_\_\_\_\_ FT. \_\_\_\_\_ HR. A.D.  
 STARTED 7/8 /83  
 COMPLETED SAME  
 DRILLER PM  
 HELPER \_\_\_\_\_  
 FILE NO. 6342

LOCATION CARSTAB FACILITY  
GROUND WATER STUDY  
CINCINNATI, OHIO  
 CLIENT THIOKOL/CARSTAB CORPORATION  
CINCINNATI, OHIO



NOTES:

LEGEND:

☒ - SPLIT SPOON, 
 ☐ - SHELBY TUBE, 
 ☐ - PISTON, 
 ☐ - AUGER, 
 ☐ - ROCK CORE, 
 ☒ - CALIBRATED PENETROMETER  
 W.D. - WHILE DRILLING, A.D. - AFTER DRILLING

THE "N" VALUES IN THE STANDARD PENETRATION TEST ARE BLOWS PER FOOT REQUIRED TO DRIVE A 2" O.D. SPLIT SPOON SAMPLER USING

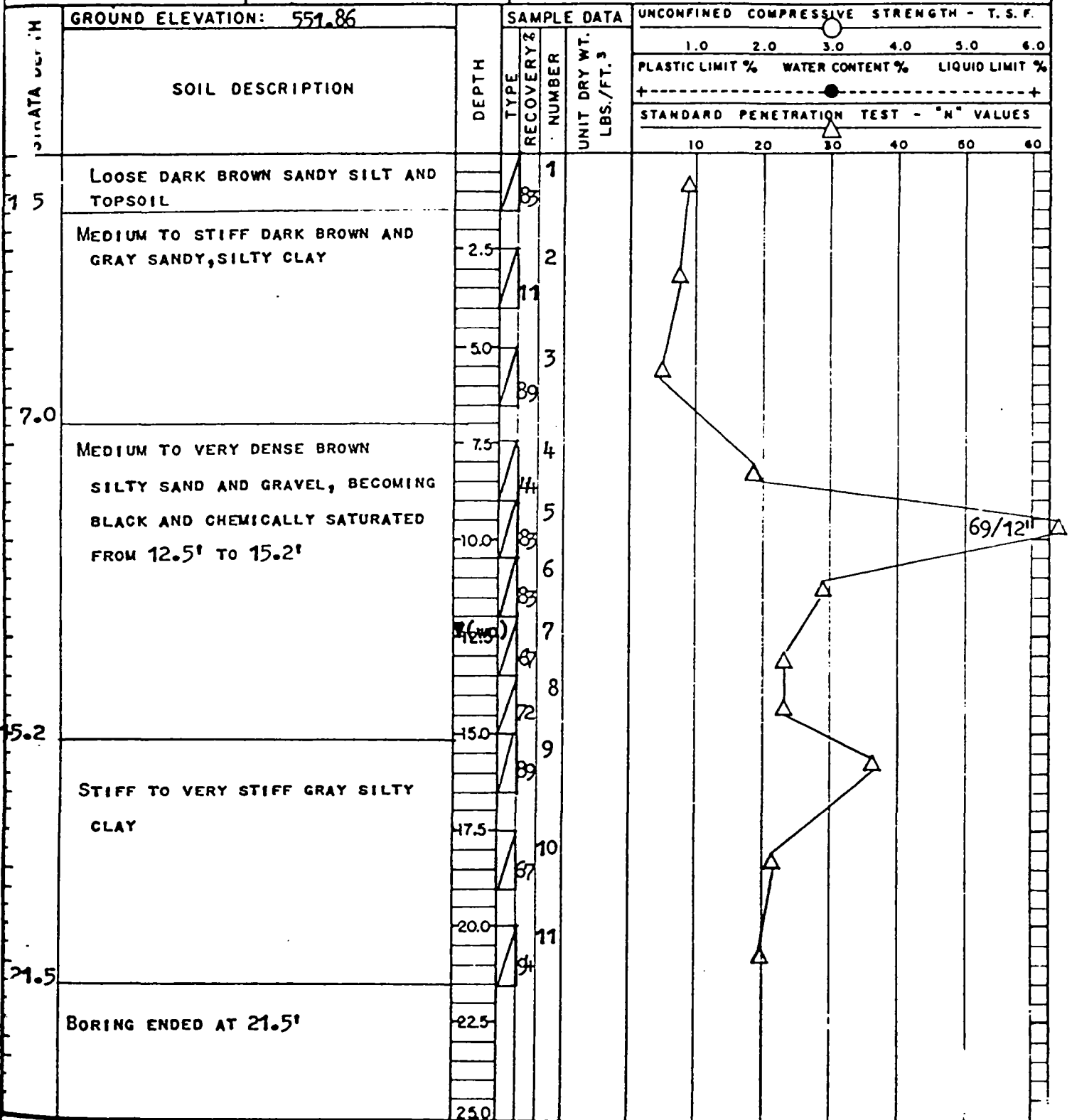
ALISBURY ENGINEERING  
1501 E. MAIN STREET, GRIFFITH, IND.

BORING NO. — MW13 —

WATER LEVEL DATA  
2.6 FT. W.D.  
12.9 FT. 7/20/83  
— FT. — HR. A.D.  
— FT. — HR. A.D.

STARTED 7/8/83  
COMPLETED SAME  
DRILLER PM  
HELPER  
FILE NO. 6342

LOCATION CARSTAB FACILITY  
GROUND WATER STUDY  
CINCINNATI, OHIO  
CLIENT THIokol/CARSTAB CORPORATION  
CINCINNATI, OHIO



NOTES:

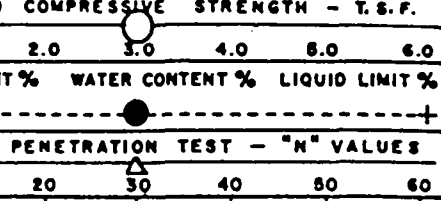
LEGEND:  
[ ] - SPLIT SPOON, [ ] - SHELBY TUBE, [ ] - PISTON, [ ] - AUGER, [ ] - ROCK CORE, [ ] - CALIBRATED PENETROMETER  
B.D. - WHILE DRILLING, A.D. - AFTER DRILLING

THE "N" VALUES IN THE STANDARD PENETRATION TEST ARE BLOWS PER FOOT REQUIRED TO DRIVE A 2" O.D. SPLIT SPOON SAMPLER USING A 140 POUND WEIGHT FALLING FREE FOR A DISTANCE OF 30".

**SALISBURY ENGINEERING**  
**1501 E. MAIN STREET, GRIFFITH, IND.**

**BORING NO.**      **MW14**     

STRATA DEPTH	FILE NO.	DEPTH	SAMPLE DATA			UNCONFINED COMPRESSIVE STRENGTH - T.S.F.									
	SOIL DESCRIPTION (CONTINUED FROM 22.5')		TYPE	RECOVERY	NUMBER	UNIT DRY WT. LBS./FT. <sup>3</sup>	1.0	2.0	3.0	4.0	5.0	6.0			
							PLASTIC LIMIT %			WATER CONTENT %			LIQUID LIMIT %		
							STANDARD PENETRATION TEST - "N" VALUES								
						10	20	30	40	50	60				
22.5															
25.0	MEDIUM TO VERY DENSE GRAY AND BROWN SILTY SAND, SOME GRAVEL GRADING TO A TRACE OF GRAVEL		89	10											
26.5				11											
27.5	STIFF TO VERY STIFF GRAY SILTY CLAY		89												
30.0				12											
			72												
	BORING ENDED AT 30.0'														



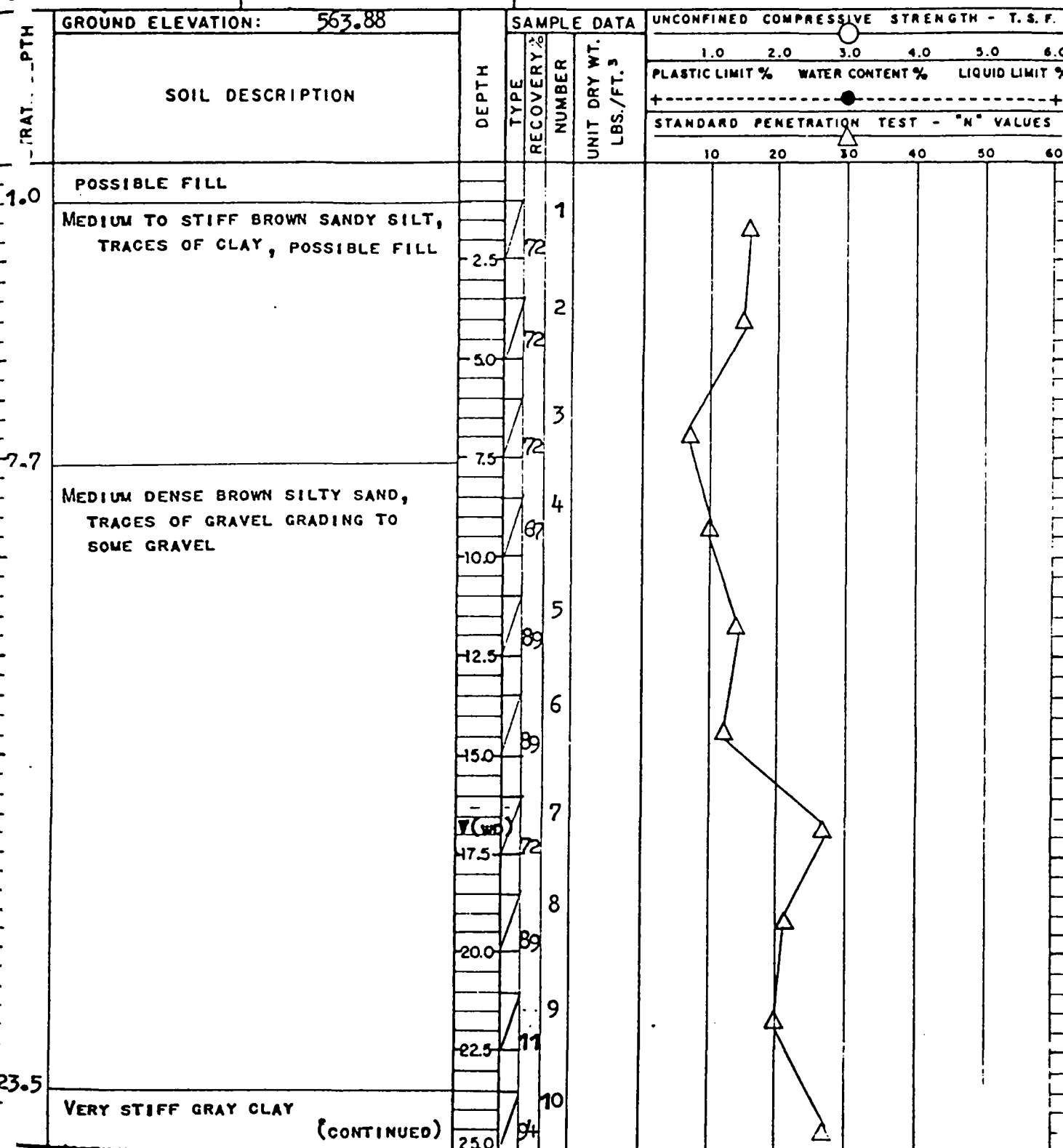
ALABAMA ENGINEERING  
101 E. MAIN STREET, GRIFFITH, IND.

BORING NO. MW15

WATER LEVEL DATA  
1.0 FT. W.D.  
1.2 FT. 7/20/83  
FT. HR. A.D.  
FT. HR. A.D.

STARTED 7/11/83  
COMPLETED SAME  
DRILLER PM  
HELPER  
FILE NO. 6342

LOCATION CARSTAB FACILITY  
GROUND WATER STUDY  
CINCINNATI, OHIO  
CLIENT THIOKOL/CARSTAB CORPORATION  
CINCINNATI, OHIO



NOTES:

LEGEND:

□ - SPLIT SPOON, ■ - SHELBY TUBE, □ - PISTON, □ - AUGER, ▨ - ROCK CORE, ⊕ - CALIBRATED PENETROMETER  
W.D. - WHILE DRILLING, A.D. - AFTER DRILLING

THE "N" VALUES IN THE STANDARD PENETRATION TEST ARE BLOWS PER FOOT REQUIRED TO DRIVE A 2" O.D. SPLIT SPOON SAMPLER USING 140 POUND WEIGHT FALLING FREE FOR A DISTANCE OF 30".



SALISBURY ENGINEERING  
1501 E. MAIN STREET, GRIFFITH, IND.

BORING NO. MW15

PTH GRAY	FILE NO.	DEPTH	SAMPLE DATA			UNCONFINED COMPRESSIVE STRENGTH - T.S.F.									
	SOIL DESCRIPTION		TYPE	RECOVERY	NUMBER	UNIT DRY WT. LBS./FT. <sup>3</sup>	1.0	2.0	3.0	4.0	5.0	6.0			
							PLASTIC LIMIT %			WATER CONTENT %			LIQUID LIMIT %		
							STANDARD PENETRATION TEST - "N" VALUES								
	(CONTINUED FROM 22.51	22.5				10	20	30	40	50	60				
23.5	MEDIUM DENSE BROWN SILTY SAND, TRACES OF GRAVEL GRADING TO SOME GRAVEL				10										
	VERY STIFF GRAY CLAY	25.6			11										
27.5	BORING ENDED AT 27.5'	27.5													
		30.6													



ALABAMA ENGINEERING  
301 E. MAIN STREET, GRIFFITH, IND.

BORING NO. MW16

WATER LEVEL DATA		STARTED 7/12/83	LOCATION CARSTAB FACILITY
2.5 FT. W.D.		COMPLETED SAME	GROUND WATER STUDY
2.0 FT. 7/20/83		DRILLER PM	CINCINNATI, OHIO
FT. HR. A.D.	HELPER	CLIENT THIOKOL/CARSTAB CORPORATION	
FT. HR. A.D.	FILE NO. 6342	CINCINNATI, OHIO	

GROUND ELEVATION: 562.88		SAMPLE DATA			UNCONFINED COMPRESSIVE STRENGTH - T. S. F.								
STRATA DEPTH	SOIL DESCRIPTION	DEPTH	TYPE	RECOVERY %	NUMBER	UNIT DRY WT. LBS./FT. <sup>3</sup>	1.0 2.0 3.0 4.0 5.0 6.0						
							PLASTIC LIMIT %		WATER CONTENT %		LIQUID LIMIT %		
							+-----+-----+-----+-----+-----+-----+						
							STANDARD PENETRATION TEST - "N" VALUES						
							10	20	30	40	50	60	
2.5	STIFF DARK BROWN TOPSOIL AND SANDY SILT, FILL	2.5											
	STIFF BROWN SANDY, SILTY CLAY	5.0											
5.5	MEDIUM TO VERY DENSE BROWN SILTY SAND AND GRAVEL	7.5											
		10.0											
		12.5											
		15.0	1	72									
		17.5	2	89									
8.5	MEDIUM CLAYEY SILT AND SILTY CLAY	20.0	3	72									
10.5	DENSE TO VERY DENSE GRAY SILTY SAND AND GRAVEL	22.5	4	89									
		25.0	5	89									
(CONTINUED)													

UNCONFINED COMPRESSIVE STRENGTH - T. S. F.													
1.0 2.0 3.0 4.0 5.0 6.0													
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %													
+-----+-----+-----+-----+-----+-----+													
STANDARD PENETRATION TEST - "N" VALUES													
10 20 30 40 50 60													

(CONTINUED)

NOTES:

LEGEND:

- SPLIT SPOON, 
 - SHELBY TUBE, 
 - PISTON, 
 - AUGER, 
 - ROCK CORE, 
 - CALIBRATED PENETROMETER
- W.D. - WHILE DRILLING, A.D. - AFTER DRILLING

THE "N" VALUES IN THE STANDARD PENETRATION TEST ARE BLOWS PER FOOT REQUIRED TO DRIVE A 2" O.D. SPLIT SPOON SAMPLER USING A 140 POUND WEIGHT FALLING FREE FOR A DISTANCE OF 30".

SALISBURY ENGINEERING INC.  
1501 E. MAIN STREET, GRIFFITH, IND.

LOG OF TEST BORING NO. MW16

STRATA DEPTH	FILE NO.	DEPTH	SAMPLE DATA			UNCONFINED COMPRESSIVE STRENGTH - T.S.F.						
	SOIL DESCRIPTION (CONTINUED FROM 22.5')		TYPE	RECOVERY	NUMBER	UNIT DRY WT. LBS./FT. <sup>3</sup>	1.0	2.0	3.0	4.0	5.0	6.0
							PLASTIC LIMIT %		WATER CONTENT %		LIQUID LIMIT %	
							STANDARD PENETRATION TEST - "N" VALUES					
						10	20	30	40	50	60	
	DENSE TO VERY DENSE GRAY SILTY, SAND AND GRAVEL	22.5		5								
25.0		25.0	89	6								
27.5	STIFF TO VERY STIFF GRAY SILTY CLAY	27.5	72	7								
30.0		30.0	44									
	BORING ENDED AT 30.0'											

## DRILLING LOG

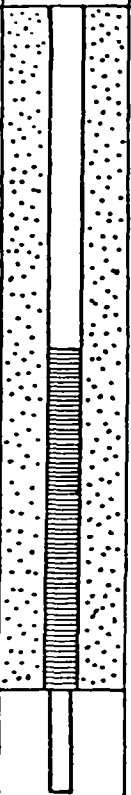
Page 1 of 2

State Ohio Start Date January 6, 1981  
 Site Carstab Completion Date January 6, 1981  
 Boring No. E1 Ground El. 556.40  
 Drilling Firm H.C. Nutting Co. Groundwater El. \_\_\_\_\_  
 Type of Drill CME 750 at completion \_\_\_\_\_  
 Driller J. D. Martin after \_\_\_\_\_ days \_\_\_\_\_  
 Geologist Rod Bloese Total Depth of Boring 21.5

Elev.	Depth	Description	Blow Count	Sample No.	Remarks	Well Const.
		Ground Surface				
	1	Dark brown silty clay	4	JAR	1-3/8" I.D. Split Spoon; 140 lb. Hammer; 30" Drop	
	2		4	1		
	3		7		3-1/4" I.D. Hollow Stem Auger	
	4	Brown sandy clay	2	JAR		
	5		2	2	Sand seam 3.0-3.5	
	6		3			
	7	Brown sandy clay with trace of fine gravel	2	JAR		
	8		4	3		
	9		5			

11/13/81

State OhioBoring No. E1Site CarstabPage 2 of 2

Elev.	Depth	Description	Blow Count	Sample No.	Remarks	Well Const.
	11	Gray silty clay with trace of gravel	4	JAR		
			9	4		
			11			
	12					
	13					
	14					
	15					
	16	Grayish brown sand, fine to medium, with trace of fines	3	JAR		
			4	5		
			10			
	17					
	18					
	19					
	20					
	21	Grayish brown sand, coarse, with trace of fine gravel, maximum 1/2"	17	JAR	Bottom of hole 21.5	
			14	6		
			8			
	22					

11/13/81

## DRILLING LOG



Page 1 of 2State OhioStart Date January 7, 1981Site CarstabCompletion Date January 7, 1981Boring No. E2Ground El. 563.31Drilling Firm H.C. Nutting Co.Groundwater El.  
at completion 543.31 (20)Type of Drill CME 750after      days     Driller J. D. MartinTotal Depth of Boring 27.0Geologist Rod Bloese

Elev.	Depth	Description	Blow Count	Sample No.	Remarks	Well Const.
		Ground Surface				
	1	Fill-Black clay/sand & f. gravel	3		1-3/8" I.D. Split Spoon, 140 lb. Hammer; 30" Drop 3-1/4" I.D. Hollow Stem Auger	
		Brown sandy clay with trace of gravel	4	JAR		
			4	1		
	2					
	3	Brown clayey sand	3	JAR		
			4	2		
	4		4			
	5					
	6	Brown sand, fine to medium, with trace of fine gravel	1	JAR		
			1	3		
			1			
	7					
	8					
	9					

11/13/81



State OhioBoring No. E2Site CarstabPage 2 of 2

Elev.	Depth	Description	Blow Count	Sample No.	Remarks	Well Const.
	11	Brown sand, fine to medium, with trace of fine gravel	6	JAR		
			15	4		
			10			
	12					
	13					
	14					
	15					
	16	Brown sand, medium, with gravel	15	JAR		
			20	5		
			23			
	17					
	18					
	19					
	20					
	21	Gray sandy clay with trace of fine gravel (sand lenses)	3	JAR	Hit water at 23.0	
			7	6		
			7			
	22					
	23					
	24					
	25	Dark gray sand, coarse, with gravel	14	JAR		
			20	7		
	26	Brown silty clay with trace of fine gravel	16	JAR 8		
	27					
					Bottom of Hole 27.0	

11/13/81

## DRILLING LOG

Page 1 of 2

State Ohio Start Date January 7, 1981  
 Site Carstab Completion Date January 8, 1981  
 Boring No. E3 Ground El. 553.88  
 Drilling Firm H.C. Nutting Groundwater El. \_\_\_\_\_  
 Type of Drill CME 750 at completion \_\_\_\_\_  
 Driller J. D. Martin after \_\_\_\_\_ days \_\_\_\_\_  
 Geologist Rod Bloese Total Depth of Boring 21.5

Elev.	Depth	Description	Blow Count	Sample No.	Remarks	Well Const.
		Ground Surface				
	1	Fill-Gravel w/ clay, sand, silt	18		1-3/8" I.D. Split Spoon, 140 lb. Hammer, 30" Drop 3-1/4" I.D. Hollow Stem Auger	
		Gray clayey silt	9	JAR		
			3	1		
	2					
	3	Gray clayey sand, fine to medium	1	JAR		
			2	2		
	4		2			
	5					
	6	Gray silty sand, fine to medium with trace of gravel	2	JAR		
			3	3		
			7			
	7					
	8					
	9					

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Elev.	Depth	Description	Blow Count	Sample No.	Remarks	Well Const.
	11	Dark gray sand, coarse to medium, with fine gravel, and trace of fines	10	JAR	Noticable Odor	
			14	4		
			14			
	12					
	13					
	14					
	15	Grayish brown silty clay with trace of fine gravel			Completed drilling on 1/7/81 at 15.0	
	16		6	JAR		
			9	5		
			13			
	17				Hit water at 17.5	
	18					
	19					
	20					
	21	Gray clayey silt with fine sand seams	6	JAR		
			13	6		
			30			
	22				Bottom of Hole 21.5	

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